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EARLY PULMONARY TUBERCULOSIS IN CHILDHOOD.¹

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A DISTINGUISHED physician not long ago remarked that the diagnosis of early pulmonary tuberculosis "is one of the most difficult problems in medicine." With that dictum, few who have had much experience in the matter will be disposed to quarrel, and it may safely be added that the diagnosis is a matter of greater difficulty in children than in adults. Therefore, and because of the great and increasing importance of early diagnosis in tuberculous lung lesions, no apology is needed for any attempt to contribute to the knowledge of the subject.

This communication is based upon an analysis of the results of an investigation, clinically and otherwise, into certain important points in connection with approximately 300 cases of pulmonary tuberculosis (mostly incipient) among school children attending elementary schools in the county of Cumberland, of which 300 cases a careful record has been kept. There are approximately 29,750 elementary school children in Cumberland, and among these 296 cases of pulmonary tuberculosis have been diagnosed. Of the 296 cases recorded 53 have left school; if these be classified and deducted from the appropriate groups, the *percentage* distribution of pulmonary tuberculosis among the school children of the county is—Whole county: 0·8 per cent. Rural: Boys

¹ Abstract of a thesis for which the degree of M.D. was awarded (with commendation) by the University of Edinburgh.

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0·8 per cent., and girls 0·7 per cent. Urban: boys 0·8 per cent., and girls 0·9 per cent. From these figures it is manifest that in the county of Cumberland the pulmonary tuberculosis or "phthisis" rate is practically uniform among boys and girls, and in urban and rural districts, with the exception of the slight increase in urban girls as compared with rural girls.

Age Incidence.

The ages of the cases submitted to examination are indicated in the following table:

TABLE I.—INDICATING THE AGE INCIDENCE OF CASES.

Age.	Cases.	Age.	Cases.
3	0	12	37
4	5	13	34
5	19	14	6
6	37	15	1
7	38	Age not stated }	5
8	40		
9	25	Total ...	296
10	31		
11	18		

The above figures are very striking, and would seem to indicate some relation between the commencement of school life and the incidence of pulmonary tuberculosis. At age 3 no cases of "phthisis" were diagnosed, although what might be described as a "respectable" number of children were examined at that age; at age 4, by which time a considerable number of children have completed several months, if not a full year, of school life, 5 cases were diagnosed; while 19 cases were diagnosed at age 5, and by that time, of course, the children who entered school at 3 and 4 years of age (who among them represent numbers equal to those of the average of the later years of school life) have completed on the average at least twelve months of school life. By the fifth birthday every child has theoretically entered school, and in practice most have, so that by the age of 6, when the numbers diagnosed have jumped to 37, every child has had twelve months of school life at least. The incidence for those years of school life during which average numbers of children are examined seems to lie between 34 and 40; for while at ages 9 and 10 the numbers fall much lower, yet one must remember that considerably fewer children are examined at these ages, while at ages 11, 14, and 15, when the incidence falls respectively much lower and very low indeed, respectively much fewer and very few children indeed are examined.

The figures for the earlier years seem to constitute a very serious

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indictment of the influence of school life on children predisposed to tuberculosis, for it is very difficult to read any other meaning into them than this—that those children who have become infected with tuberculosis during infancy or very early childhood, as Hamburger¹ contends is frequently the case, but who have been able to resist the attack so long as they are running about in the open air, break down when the time comes for them to spend a large part of each day in stuffy and overcrowded classrooms, with, as is frequently the case, very imperfect ventilation.

Weight and Nutrition.

The weights of all pretuberculous and phthisical children in the county area are carefully recorded at short intervals. The returns with regard to phthisical children are very striking and are shown in the following table:

TABLE II.—INDICATING WEIGHTS OF 274 CHILDREN.

Weight.	Number.	Percentage.
Above average weight 	68	24·8
Average 	30	10·9
Below average 	176	64·3

Of those above the average, the average amount in excess of the standard was 6·09 pounds. Of those below the average, the average amount below the standard was 7·9 pounds. The averages were obtained from Tuxford and Glegg's figures for county areas, and the weight in each case compared with the standard weight (according to sex) for that age. We know that in adult cases *loss of weight* is one of the diagnostic symptoms of tuberculosis. The number of cases where the parent or other responsible person had observed loss of weight in the 300 or so cases of this inquiry were recorded; the total number reporting loss of weight as an observed symptom was 61 (= 20·6 per cent.). Yet the figures above show that 64·3 per cent. had actually a weight averaging more than half a stone below the standard. The explanation of the apparent inconsistency may be lack of observation on the part of the parent: more probably, I think, the explanation is that these children had been habitually poorly nourished and below par. Dr. Eric Pritchard, I think, coined a better phrase, so far as children are concerned, when, instead of *loss of weight*, he spoke of *failure to put on weight*; and even a better phrase would be, I think, *inadequate increase of weight*, for physiologically even the phthisical child is automatically increasing in weight year by year.

The whole question of weight is bound up with nutrition, and the

¹ Hamburger (quoted): *School Hygiene*, vol. ii., No. 3.

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two ought not to be considered independently. To demonstrate that weight alone is not an infallible guide, the fact that 24·8 per cent. of the phthisical cases averaged 6 pounds over the standard may be reiterated, and even more instructive is a study of the following table. The following are some cases of more or less advanced phthisis in children, where the weights recorded did not correspond with what one would have expected from the lung condition.

TABLE III.—INDICATING ANOMALIES OF WEIGHT.

Case.	Condition.	Weight.
R. M.	Extensive phthisis both lungs (with cavitation).	Average.
C. M.	Advanced phthisis whole of both lungs.	"
J. S.	Extensive phthisis both lungs.	"
J. F.	" " (cavity).	1 pound above average.
W. E.	Cavitation right lung.	3 pounds " "
S. J.	Advanced phthisis both lungs.	3 " " "
B. W.	" " "	4 " " "
B. D.	*Extensive phthisis both lungs, cavitation, very poor nutrition, Erb's paralysis.	4 " " "
J. P.	Cavitation (right apex).	5 " " "
R. K.	" (left apex).	7 " " "
E. E.	Extensive phthisis right lung (cavitation).	17 " " "
J. H.	Phthisis both apices (history of hæmoptysis).	18 " " "
T. N.	*Marked dulness over whole of both lungs, poor nutrition, anæmia.	20 " " "
J. K.	Advanced phthisis whole of left lung.	21 " " "

The cases marked *, particularly the one T. N., emphasize the importance of considering weight and nutrition together, and not alone.

The importance of nutrition in diagnosing incipient intrathoracic tuberculosis, especially in children, is being more and more realized. The manifestations of impaired nutrition are various: pallor, anæmia, systolic cardiac bruits, general lassitude and weariness, complaints of being "easily tired," loss of appetite, gastric disturbance, headaches, etc. In the series of cases under review the following was the state of affairs:

TABLE IV.—INDICATING DEFECTS OF NUTRITION.

Classified definitely as of poor or very poor nutrition	...	91 (= 30·8 per cent.)
Poor appetite	...	36 (= 12·2 ")
Anæmic	...	22 (= 7·4 ")
Systolic cardiac murmurs other than those classed as anæmic	...	10 (= 3·4 ")
Languid and easily tired	...	19 (= 7·0 ")

With regard to some of these figures there may be some overlapping, but, on the other hand, in many cases it was impossible to get facts as to appetite, lassitude, etc. On the whole, it is safe to say that at least 40 per cent. gave evidence of impaired nutrition in one or other of its manifestations.

Impaired nutrition may be either a cause—*i.e.*, a predisposing cause

—or a result of incipient tuberculosis. It is highly probable that defective nutrition is the *first visible sign* of the tuberculous infection, the evidence of the circulation of the tubercular toxin, before any clinical manifestations recognizable as such are evident in the lungs. Many, perhaps most, authorities nowadays, supported by evidence from the post-mortem table, agree that in the majority of cases the primary site of the lesion in the lung is the broncho-tracheal and peribronchial glands, *too deep to be clinically recognizable* except for certain minor phenomena which will be detailed later.

Assuredly the state of the nutrition of the child, in all its aspects, is one of the points calling for special attention in the diagnosis of incipient tuberculosis.

The Meaning of Night Sweats.

In 165 (55·8 per cent.) of our cases a history of night sweating was obtained; no doubt, had it been possible to interview parents in all cases, a much higher percentage would have been recorded. The value of the above figures for diagnostic purposes is very doubtful. There is no doubt that in many cases the parents give an affirmative answer to a question on this subject without much justification for doing so; many, even, give such an answer although they sleep in separate rooms and rarely see the children in bed. It must be remembered, too, that children perspire more freely and readily than adults, and that in many cases perspiration at night may have no pathological significance in children, or may mean at most a slight chill or a disordered stomach. I attach great importance to a history of *heavy night sweats*, where, for example, the mother says that the child "sweats something awful" or is "wringing wet every night," and so on. It is especially significant when the sweats are described as "cold," "clammy," etc., on the forehead or scalp. In 30 cases (10·2 per cent.) a history of *heavy* night sweats was obtained.

The Occurrence of Cough.

In 134 cases (45·3 per cent.) the child was stated to be troubled with a cough. The value of a cough as a diagnostic symptom is, like sweating, somewhat empirical. The length of time for which a cough can persist without being regarded with suspicion, naturally, is a matter of opinion, and varies considerably. I have lately read the report of one School Medical Officer who regards with suspicion a cough lasting for more than three weeks. Personally I think that is much too short a limit to set. On the other hand, when one finds a cough, especially in summer, which has persisted for several months, there is little doubt that very grave suspicion must attach to the symptom. Perhaps more important than the duration is the type of cough, a short, dry, "hacking" cough being vastly more important

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than a heavy cough with profuse sputum, frequently indicating a chronic bronchial catarrh, a by no means rare condition in children, at least in a damp climate like Cumberland. The parent frequently describes the type of short cough with no sputum by saying, "It seems to come from her throat," or, "I thought it was just a habit," and I feel sure that this type of short, sharp cough with gradual onset is the type which one has to be on the lookout for in phthisis which is *incipient*. The explanation of this "hollow spasmodic cough without expectoration or obvious cause," as Pritchard¹ points out, is probably the irritation of a tubercular adenitis in the mediastinum.

The Pathological Condition in the Lungs.

Site of the Lesion.—In 1880 Sir James Kingston Fowler stated that the primary focus is usually 1 to 1½ below the extreme apex. The question as to which part of the lung is most commonly the site of the tuberculous invasion is, naturally, a subject which has been widely discussed. Reference has already been made to the fact that we may have to distinguish between the *primary focus* (possibly in the glands at the root of the lung) and the *primary focus clinically recognizable* at the apex or some other part of the lung. In discussing the site of the earliest lesion, one is obviously referring to the latter of these. Most observers find that the right apex is the commonest site of invasion. On the other hand, Dr. Wade,² in a series of 24 localized cases, found that 12 "had their site of disease in the right lower lobe." He gives as a possible explanation of this the fact that "the main stem of the right bronchus passes directly into the lower lobe," whereas the branches to the other lobes of the right lung are given off at an angle. The right bronchus is wider than the left, and "deviates less from the mid-line than does the left." He argues, therefore, along the path of least resistance.

In our series of 287 cases the lesion was localized as indicated in the accompanying table:

TABLE V.—INDICATING SITE OF TUBERCULOUS PULMONARY LESION.

Lesion.	Number.	Percentage.
Right apex only	38	13·2
Left apex only	13	4·5
Both apices	169	58·8
" " plus one or more foci elsewhere	52	18·0
Left apex plus one or more foci elsewhere, but not at right apex	8	2·6
Right apex plus one or more foci elsewhere, but not at left apex	6	2·0

¹ Pritchard, Eric: *The Practitioner*, vol. xc., No. 1.

² Wade, T. M.: Report of S.M.O. for Monmouthshire, 1912.

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From the above table two facts are clear—*i.e.*, (1) in only *one case* (0·3 per cent.) was *neither* apex involved; (2) the apices of *both* lungs were affected (with or without some other part of one or other lung) in 221 cases (76·8 per cent.). It is obvious that, in cases where both apices are involved, one may be more affected than the other; the figures showing the relative frequency are as follows: Cases in which the disease at the right apex was more advanced than at the left, 36 (16 per cent.); cases in which the disease at the left apex was more advanced than at the right, 2 (0·9 per cent.).

It is therefore manifest, in this series of cases, that, where one apex only was involved, the right apex was involved in three times as many cases as the left; and further that, where (both apices being involved) there was any marked difference in the degree of advancement of the disease as between the apices, the right apex showed a more extensive lesion than the left in nearly every case.

The Detection of Pulmonary Dulness.

TABLE VI.—INDICATING DULNESS ON PERCUSSION OVER THE AFFECTED PART.

Degree.	Number.	Percentage.
Very slight dulness ...	70 cases	23·6
Moderate dulness ...	121 "	40·9
Marked dulness ...	91 "	30·8

Thus, in 282 out of 296 cases, or 95·3 per cent., dulness greater or less was present. Unquestionably the presence or absence of dulness is a factor of the very first importance in the diagnosis of early phthisis. Some observers say that dulness can be demonstrated in every case of incipient phthisis. Dr. Lees¹ in a recent notable communication went farther, and claimed that dulness is not only demonstrable in every case, but is demonstrable before any other clinical evidence—by, *e.g.*, the stethoscope—is forthcoming.

Presence of Accompaniments.

TABLE VII.—INDICATING ACCOMPANIMENTS TO THE BREATH SOUNDS.

Adventitious Sounds.	Number.	Percentage.
Rhonchi	59 cases (one doubtful)	19·9
Fine crepitations	71 " (eleven doubtful)	24·0
Coarse crepitations	32 "	10·8
Friction	5 "	1·7

¹ Lees, D. B. : *The Lancet*, November 9, 1912.

It is, of course, almost superfluous to say that many of the cases in which accompaniments occur are due to supervening cold. It is difficult, and almost impossible, to arrive at an accurate estimate of the importance of accompaniments where frequent and regular examinations cannot be undertaken. It may be said, however, that *coarse* crepitations are of little importance in *incipient* phthisis; they may practically be disregarded. Rhonchi, too, are usually associated with a passing cold. On the other hand, friction is of great importance (acute illness being excluded), as it is generally accepted that pleurisies of a chronic or semi-chronic type in children are almost invariably tubercular. Fine crepitations present the chief difficulty; they are frequently due to a cold, but on the other hand, if *persistent*, they are almost certainly an indication of a tuberculous lesion, and if *localized* they are very suspicious at any time, especially if *localized* to one apex. In general, of course, it may be said with equal truth of all accompaniments, that the more localized the more suspicious they are.

Character of Breath Sounds.

Nearly every observer records "inequality of the breath sounds" between corresponding parts of the two lungs as one of the earliest symptoms of pulmonary tubercle. The explanation is, probably, defective entry of air into the affected part of the affected lung, due to pressure on the bronchus or bronchiole by enlarged tuberculous glands in the neighbourhood. In estimating this inequality, due regard must be paid to the physiological differences between the breath sounds in the upper lobes of the two lungs, due to anatomical differences.

No definite figures can be given as to the frequency with which this condition occurred in the series of cases under consideration, but this may be said, that it was found much less frequently than might have been expected from the figures of other observers. The explanation is probably to be found in Dr. Gair Johnstone's¹ remark that "inequality in the breath sounds is often succeeded by definite bronchial breathing." Bronchial breathing was found in the great majority of the cases under review, and, having regard to the impossibility of avoiding comparatively long intervals between examinations in wide rural areas, it is probable that the explanation may be that the duration of the period of inequality is comparatively short, and that it soon passes from that to the period of bronchial breathing, which may apparently last almost indefinitely in cases remaining more or less *in statu quo*, or where the progress of the disease is very gradual.

¹ Johnstone, Gair: Report of S.M.O. for Kirkcudbrightshire, 1912-13.

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Re-Examination of Cases.

At varying periods after the primary diagnosis, but all within two years thereafter, 214 re-examinations have been made. The results of these re-examinations have been very carefully classified according to age, sex, and geographical distribution, in order to find out what class of cases show most tendency to *spontaneous* improvement and overthrow of the tuberculous infection, it being felt that valuable information might be obtained therefrom as to what class of children it is specially desirable to have treated in open-air schools (assuming that there will not be room for all, as, unfortunately, in most educational areas will, for a time at least, be the case), and what class of cases may be left more or less to work out their own salvation on hygienic lines at home. The words "spontaneous improvement" have been used because hitherto very few phthisical children have received specialized treatment in the county; a few have had tuberculin or dispensary treatment, fewer have been in sanatoria, but generally treatment has been confined to advice to the parents as to the benefits of open windows, suitable food, and so on.

TABLE VIII.—INDICATING SEX DISTRIBUTION.

Case.	Number Re-examined.	Improved.	In Statu Quo.	Worse.
Boys ..	99	42 (42'4%)	29 (29'3%)	28 (28'3%)
Girls ...	115	58 (50'4%)	32 (27'8%)	25 (21'7%)

These figures would seem to justify the comment that girls have considerably more tendency to spontaneous improvement than boys.

TABLE IX.—INDICATING AGE DISTRIBUTION.

Age.	Number Re-examined.	Improved.	In Statu Quo.	Worse.
4	5	2 (40'0%)	1 (20'0%)	2 (40'0%)
5	18	9 (50'0%)	5 (27'8%)	4 (22'2%)
6	32	11 (34'4%)	12 (37'5%)	9 (28'1%)
7	22	10 (45'0%)	7 (31'6%)	5 (22'8%)
8	36	16 (44'4%)	11 (30'6%)	9 (25'0%)
9	19	9 (47'4%)	5 (26'3%)	5 (26'3%)
10	31	17 (54'8%)	11 (35'5%)	3 (9'7%)
11	15	5 (33'3%)	2 (13'3%)	8 (53'2%)
12	18	11 (61'2%)	5 (27'7%)	2 (11'1%)
13	8	5 (62'5%)	1 (12'5%)	2 (25'0%)
14	2	1 (50'0%)	—	1 (50'0%)
Age not specified }	3	—	—	—

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The numbers for each age group are not large enough to allow one to dogmatize, but in a general way it may be remarked that, excluding the eleven-year-old group, the tendency to spontaneous improvement seems to increase from age 6 onwards.

TABLE X.—INDICATING GEOGRAPHICAL DISTRIBUTION.

	Number Re-examined.	Improved.	Much Improved.	In Statu Quo.	Worse.	Much Worse.
Rural areas	83	38 (45·8%)	10 (12·0%)	21 (25·3%)	13 (15·7%)	1 (1·2%)
Urban areas	131	44 (33·6%)	8 (6·1%)	40 (30·5%)	36 (27·5%)	3 (2·3%)

TABLE XI.—INDICATING DISTRIBUTION.

(Condensation of Table X.)

	Number Re-examined.	Improved (including Much Improved).	In Statu Quo.	Worse (including Much Worse).
Rural areas	83	48 (57·8%)	21 (25·3%)	14 (16·9%)
Urban areas	131	52 (39·7%)	40 (30·5%)	39 (29·6%)

This table makes it abundantly clear that spontaneous improvement is very much more common among children in rural than in urban areas, and, conversely, that the disease advances more quickly in urban children. One would, of course, expect this, but the figures covering so large a number of cases are very striking. They are the more striking when one remembers that more parents of phthisical children have received advice in urban than in rural areas, and therefore, presumably, more has been done by the use of cod-liver oil and various tonics, as well as by attention to personal hygiene and open windows, to aid the urban children in their struggle for health, than has been done for children in rural areas. It is, too, almost impossible in crowded urban areas to keep in touch with all the children who belong to the "migratory" population, and lately one has come across the notification of several deaths of children from tuberculosis, and across several cases of advanced phthisis in children not attending school who were not known of when these tables were compiled; all these children were in urban areas, and it is therefore certain that the foregoing tables understate rather than overstate the detrimental influence of town life on children suffering from incipient phthisis.

There are many of us who think that the effort to eradicate tuberculosis from among us has begun at the wrong end—that the stable is being locked after the horse has been stolen. Certainly many areas have made and are making elaborate provision for the treatment of

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adult cases of tuberculosis in all stages, without making adequate provision for the treatment of those cases of early tuberculosis which, from the point of view of those who look ahead, seem most likely to repay treatment—namely, cases of incipient and threatened pulmonary tuberculosis in childhood. Those, and unfortunately they are many, who hesitate at the expense and question the utility of open-air schools, should find food for thought in these figures.¹

General Summary of Conclusions.

1. That the commencement of school life has a prejudicial effect on children predisposed to pulmonary tuberculosis.

2. That *inadequate increase of weight* is very suspicious, and that weight and nutrition should not be considered independently.

3. That *defective nutrition* is *probably the earliest indication of a tuberculous infection*, before any recognizable physical signs are present.

4. That night sweating is only significant when the sweats are *heavy* and characteristic.

5. That a persistent hard, dry cough is the most suspicious type of cough.

6. That in nearly every case one or other apex is affected, and that the right apex is most often the first *clinically recognizable focus*.

7. That dulness is almost invariably present over the affected lung.

8. That *inequality of the breath sounds* is a very early indication of trouble; that the duration of this is short, and that it is usually succeeded by bronchial breathing, which is nearly always present and which remains indefinitely.

9. That friction and *fine* crepitations are the most significant accompaniments; and that all accompaniments when *persistent*, and especially if *localized*, are suspicious.

10. That spontaneous improvement is more common in girls than in boys; that from the sixth year the tendency to spontaneous improvement increases year by year; and that children in rural areas show a very much greater tendency to spontaneous improvement than children in urban areas.

¹ See articles in "Tuberculosis in Infancy and Childhood," edited by Dr. T. N. Kelynack. London: Baillière, Tindall and Cox, 1908. And also the recently-issued *Year-Book of Open-Air Schools and Children's Sanatoria*. London: John Bale, Son and Danielsson, 1915. Those requiring further references to works dealing with subjects raised in this paper will do well to consult the following: Dickinson, W. H.: "The Tuberculosis Problem in Newcastle." Hamburger (quoted): *School Hygiene*, vol. iii., No. 2. Kerr, James: *School Hygiene*, vol. i., No. 1. Latham, Arthur: *The Practitioner*, vol. xc., No. 1. Pritchard, Eric: *The Practitioner*, vol. xc., No. 1. Archibald, Marion: Report of School Medical Officer for Ilkeston, 1912. Wade, T. W.: Report of School Medical Officer for Monmouthshire, 1912. Jordan: *The Practitioner*, February, 1912. Taylor, D. M.: *BRITISH JOURNAL OF TUBERCULOSIS*, vol. vii. Johnstone, Gair: Report of School Medical Officer for Kirkcudbrightshire, 1912-13. Lees, D. B.: *The Lancet*, November 9, 1912. Riviere, Clive: "The Diagnosis of Early Tubercle." London: Oxford Press Publications, 1913.

THE INDICATIONS FOR SURGICAL INTERVENTION IN PULMONARY TUBERCULOSIS.

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THE treatment of tuberculosis of the different parts of the body must necessarily vary somewhat according to the character of the organs or tissues involved, but the general principles underlying the treatment are the same in all cases. The most important may be summarized as follows: Improvement of the general health of the patient; suitable environment in respect of fresh air, sun, and climate; immobilization of the affected part; the local removal of tuberculous tissue (*e.g.*, synovial membrane and diseased bone from a joint, granulation tissue from a psoas abscess); drainage of cavities secondarily infected by pyogenic organisms; and in some cases the use of tuberculin, the use of antiseptics, and amputation.

Apart from the lungs, tuberculosis attacks most commonly the joints, and it is a well-established fact that the ordinary hygienic measures alone are of practically no avail in combating the disease, once it is established in the bone or synovial membrane. Arrest of tuberculous disease is, however, possible in a very large percentage of cases if treatment by immobilization is employed with hygienic measures in the earlier cases, together with removal of the diseased tissue in the later cases; while, when secondary infections have developed, immobilization of the part and drainage of the abscess are essential. As is necessarily the case in all diseases, the sooner the energetic treatment is adopted (and I include under the term "energetic" immobilization, etc., as opposed to hygienic measures only), the greater the probability of a cure.

Surgical Aspects of Pulmonary Tuberculosis.

Turning now to the treatment of pulmonary tuberculosis, it is of interest to review and consider to what extent and with what advantage the above general principles have been applied. The beneficial results from attention to the general health of the patient (*e.g.*, good food, attention to the upper respiratory tract—mouth, nose, and throat—regulation of the bowels, sufficient sleep, etc., together with fresh air, and whenever possible residence in a suitable climate) cannot be denied

by anyone, but in many cases this line of treatment is insufficient, and does not do more than retard, or for a time arrest, the progress of the disease. In connection with this it must be remembered that the reaction of the tissues to pulmonary tuberculosis varies with the individual, and it is possible to find every degree of resistance to, and spread of the disease from, the small fibrous or calcareous focus to the very slow fibrosis of the lung, or to the acute fulminating, miliary, or so-called pneumonic phthisis. This presence or absence of the fibrosis which acts as a barrier to the spread of the disease is not primarily determined by the treatment so much as by the capacity for resistance in the patient. It follows from this, however, that if the resistance of the patient falls just short of what is required successfully to combat the disease, hygienic treatment may be successful by sufficiently increasing that resistance, and a cure result; or, when the primary resistance of the patient is still less, improvement of the general health may increase it to an extent adequate for the temporary arrest of the disease.

As to whether tuberculin is efficient in increasing the resistance of the patient to the bacillus and its toxins in some or all cases, it is not for me to discuss, but it is quite certain that there are a large number of cases which progress despite that treatment, even when the patients are placed in the best possible conditions of environment and are under constant observation.

Successful results, particularly as regards the amelioration of certain symptoms, are claimed from the use of antiseptics, whether introduced by inhalation or exhalation or by intrapulmonary injections. This treatment has been tried more especially in cases in which the secondary infection is a predominant feature, and cannot be seriously considered as a means of curing pulmonary tuberculosis.

Of the surgical procedures I do not intend to discuss amputation either of part or the whole of the lung. Eminently successful results have been obtained in a very few cases; but the operation is one of great danger, and in view of the more modern operations to be next considered, should not be entertained except possibly in a very exceptional case. For the same reason the transthoracic drainage of tuberculous cavities in the lung need not be dealt with here.

Immobilization of the Lung and Obliteration of Cavities.

As I have already said, immobilization, when practicable, of a part (*e.g.*, a joint) affected by tuberculous disease has been found to be the most satisfactory method of not only arresting the progress of the lesion, but also of effecting a cure. To obtain, however, the best results, the disease must be treated in the earlier stages, and the general condition of the patient must at the same time be cared for.

Hypothetically, therefore, pulmonary tuberculosis, especially if treated early, should respond favourably to treatment by immobilization. It is a well-known fact, moreover, that patients suffering from phthisis, and who survive the immediate effects of an uncomplicated pneumothorax, are often very distinctly better while the lung is in a state of collapse. Again, the "typhoid" treatment of phthisical patients may be the only non-surgical means of reducing a persistently high temperature; the "typhoid" treatment does not, of course, produce immobilization of the lung, but it reduces the movements to a very considerable extent. The whole lung is immobile only when in a state of collapse; it is necessary, therefore, to produce collapse to obtain immobilization. For practical purposes collapse of the lung can be obtained either by displacing the lung by the injection of gas within the pleural cavity, or by producing a collapse of the whole of one side of the chest-wall, and necessarily, therefore, of the contained lung. In the former case the immobilization is complete, in the latter it is very nearly so. A partial immobility of the upper lobe only, can be effected by extra-pleural displacement, and of the lower lobe only by division of the phrenic nerve.

Collapse of the whole, or part, of the lung, not only renders that organ immobile, it at the same time produces obliteration of any existing cavities. This has the advantage of overcoming the difficulties of drainage. A cavity in the lung, although communicating with a bronchus, is not efficiently drained, because as a rule the opening into the bronchus is not at the lowest part of the cavity. Even when drainage is free, the walls of the cavity cannot collapse, but are held apart by the rigidity of the chest-wall and the intra-pleural negative pressure which prevents collapse of the lung. When the lung is displaced by nitrogen or by the sinking in of the chest-wall (by rib mobilization) the collapse causes close approximation of the walls of the cavities, so preventing accumulation of secretions, and allows of obliteration later by fibrosis. The fibrosis, moreover, which is an integral part of the process of cure in tuberculosis, can proceed unimpeded by the drag of the chest-wall, and the conversion of the foci of tuberculosis into fibrous tissue is in this way unresisted.

The Selection of Cases Suitable for Treatment by Immobilization.

It is a great misconception to regard operative intervention as a measure to be adopted only when all other attempts to resist the disease have failed. The chronic case of pulmonary tuberculosis which has progressed steadily despite two or three years of treatment is not the most suitable for immobilization. Inter-pleural adhesions have in all probability formed, and will prevent the injection of any nitrogen, or at any rate of sufficient of the gas to produce an adequate

degree of collapse. In such a case the only means of immobilizing the whole lung is by rib mobilization, for which operation to be practicable the active disease must be definitely unilateral. Again, even if collapse is possible and the tubercular lesion is arrested, the symptoms which are the result of the secondary dilatation of the bronchi, almost always present in such cases, will persist. It cannot be too strongly emphasized that the early active lesion, even when of acute onset, is the type of case which will derive the most permanent benefit from collapse and consequent immobilization of the lung. The results may be equally satisfactory when cavities even exist, provided fibrosis is not excessive.

The indications for immobilization by nitrogen displacement may now be briefly summarized. Unilateral cases are obviously the most satisfactory to treat, but bi-lateral infection is no contra-indication provided there is sufficient healthy lung-tissue on the untreated side to carry on the functions of respiration. (I have reason to believe that possibly even only one lobe is sufficient.) A rapidly progressive lesion and acute miliary tuberculosis, if unilateral, should be treated immediately. A lung invaded by an acute pneumonic tubercular infection cannot, owing to its consolidated state, be collapsed, and the immobilization must necessarily be deferred till the pneumonic processes have abated. The symptoms produced by cavities—*e.g.*, sputum, fever, hæmorrhage, etc.—can be abolished by displacement of the lung and the associated collapse of the walls of the cavities. Chronic phthisis has already been referred to.

When nitrogen displacement is impracticable, rib mobilization is indicated in cases of the ordinary acute or chronic phthisis provided that the active disease is unilateral and the opposite lung is not much fibrosed.

I do not mean to suggest that immobilization of the lung is the treatment to be adopted in every case of tuberculosis, but would propose rather that when, for instance, a case of early tuberculosis is seen, a note of the clinical findings be made and a radiogram taken so as to possess an accurate pictorial record of the extent of the lesion. After a maximum period of three months, during which time the patient has been on a treatment "non-operative" in character, he should be again examined and X-rayed. Then, if a comparison of the findings before and after this period shows that the disease has progressed, immobilization should be no longer delayed. Indications, however, of the active progress of the disease, or a large hæmoptysis occurring before the three months' interval is over, should be an indication for immediate immobilization. I would suggest, further, that if, when the case is first seen, cavities are present, immobilization and collapse of the lung is the line of treatment to be adopted before all others.

I do not intend to describe in detail the methods whereby immobili-

zation and collapse of the lung can be obtained, as I have done this already in previous papers,¹ but wish to call attention rather to two points in connection with the after-treatment of patients with nitrogen displacement. Tuberculin must never be given during the production of the displacement, and I personally do not think that it should be given so long as the lung is displaced. Graduated exercises are in no way an antithesis of immobilization. The purpose of them is to improve the general tone of the body; they are a most useful auxiliary form of treatment once the immobilization of the lung is complete. In this connection also it may be pointed out that there is no reason whatsoever why patients with one lung immobilized by nitrogen displacement should not continue their normal mode of life, provided always that their general health permits it and the disease in the opposite lung is of slight extent.

RECENT VIEWS ON LARYNGEAL TUBERCULOSIS.

By HAROLD BARWELL,

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THE frequency with which the larynx is attacked in consumptive patients is difficult to estimate accurately from statistics, for much depends on whether the cases are seen in an early or late stage of the disease or recognized in the post-mortem room, and especially on whether the larynges of all cases of the series are examined, or only those who show laryngeal symptoms. Percy Kidd² estimates that 50 per cent. of patients dying of pulmonary tuberculosis show lesions of tuberculous laryngitis post mortem, and that the disease is clinically recognizable in 20 to 25 per cent. of consumptives, excluding those in the last stage of illness. Besold³, in 346 cases at the Falkenstein Sanatorium, found 20 per cent. definitely affected and 7 per cent.

¹ Morrison Davies, H.: "Recent Advances in the Surgery of the Lung and Pleura," *British Journal of Surgery*, vol. i., No. 2, 1913. "The Therapeutic Value of Gases introduced into the Pleural Cavity," *British Medical Journal*, April 25, 1913.

² Kidd, P.: Allbutt and Rolleston's "System of Medicine," vol. v., p. 366. London: Macmillan, 1909.

³ Besold: quoted by Moritz Schmidt, "Die Krankheiten der oberen Luftwege," 1903.

doubtful. Sir St. Clair Thomson,¹ of 693 cases at Midhurst, found 25·6 per cent. ; analyzed by the Turban-Gerhardt classification, according to the severity of the pulmonary disease, the proportion of laryngeal cases were—Group I. (slight) 13·7 per cent. ; Group II. (severe) 27·1 per cent. ; and Group III. (advanced) 40·8 per cent.

Tuberculous laryngitis must be considered an extremely common complication of pulmonary tuberculosis, and, although much more common in advanced cases, it occurs more often than is generally supposed in the slighter stages. The less severe lesions frequently give rise to no symptoms whatever, and can only be detected by skilled laryngoscopic examination. It therefore follows that the larynges of all consumptives should be inspected as a routine measure, and at regular intervals, in order to detect at the earliest stage a lesion which has a marked influence on the prognosis, which has a much better prospect of cure when diagnosed early, and which causes severe suffering when it has progressed to extensive disease.

Infection takes place from the tubercle bacilli present in the sputum, and the way is often prepared by a simple laryngitis set up by the other organisms commonly present. A frequent site of the earliest invasion is the inner aspect of the vocal process, where coughing readily causes an abrasion of the delicate mucosa. In a late stage the entire inner face of the arytenoid may be occupied by a deep triangular ulcer which penetrates and destroys the underlying cartilage, but this region is so foreshortened in laryngoscopic examination that the ulceration is very inconspicuous, and, when small, may easily be overlooked ; but an extension of the disease on to the vocal cord, producing redness, slight swelling, and, later, a finely nodular appearance spreading from behind forwards, is a very characteristic lesion. A unilateral redness of the cord is highly suspicious, and is seldom, if ever, seen in simple catarrh. A soft velvety swelling of the interarytenoid space is another common and characteristic early lesion ; it can readily be distinguished from the firm, even thickenings of pachydermia, which are regularly disposed on either side of a depression in the middle line. Catarrhal laryngitis and pachydermia are both frequently seen in consumptives, hence the importance of distinguishing them from true tuberculous infiltration. The upper aperture is rarely affected before the interior of the larynx, and when it is diseased the diagnosis is generally easy. The pale, soft-looking swelling of the arytenoids, often mottled with submucous tubercles, is quite distinct from true œdema, which looks like a thin red bag containing clear fluid. The epiglottis is usually last attacked, and causes the severest dysphagia when diseased ; the red sausage-shaped infiltration is pathognomonic. There is also a chronic "lupoid" form of laryngeal tuberculosis, associated with

¹ Thomson, Sir St. Clair : *Lancet*, 1914, vol. i., p. 801.

chronic phthisis, in which the epiglottis is attacked early and is slowly eaten away; this form is accompanied by remarkably little pain.

Sanatorium treatment is without doubt the most valuable means at our disposal of treating laryngeal tuberculosis; it is remarkable to see how the affected larynx cleans and becomes more healthy under this régime. Vocal rest is of great importance, and should be persevered in whenever there is a prospect of arrest of the disease. Vocal rest means absolute silence, for whispering is almost as harmful as ordinary speech; it is a depressing measure, and should not be indiscriminately persisted in in advanced and hopeless cases. Slight lesions may clear up under these measures alone, but in others local treatment is undoubtedly of benefit; prompt sanatorium treatment cannot always be procured, and I have obtained complete local healing in patients attending the hospital out-patient department. Of local measures, the galvano-cautery is now most in favour, and is very helpful, deep puncture being used in massive infiltration, and light applications made to localized superficial ulcers. Escharotics well rubbed in are of great value in diffuse superficial ulcerations of the cords and interior of the larynx; I prefer Lake's mixture, containing 50 per cent. of lactic acid, 10 per cent. of phenol, and 7 per cent. of formalin. Statistics of cures are of little value, as they will largely depend on the average severity of the cases admitted. Sir St. Clair Thomson's experience at Midhurst from 1911 shows, out of 178 cases of laryngeal tuberculosis, 37 cases (20·7 per cent.) arrested and 62 improved; of the 37, 22 had no local treatment, and in 15 the cautery was employed. At Mount Vernon Hospital many advanced cases were admitted for the relief of dysphagia. Of 45 consecutive cases in 1906, 20 were considered hopeless on admission; in the remaining 25 local treatment was employed: 6 were healed, and 7 much improved.¹

The relief of dysphagia is still, unfortunately, a very important part of the treatment of tuberculous laryngitis. It is due to infiltration of the upper aperture, and especially of the epiglottis. Insufflation of the analgesic powders, orthoform, anæsthesin, and propæsin, will in many cases give satisfactory relief; the simplest method is to allow the patient to inhale a little of the powder placed in the distal end of a straight glass tube. When the epiglottis is principally affected, its removal is by far the best palliative procedure. The operation, which I have performed since 1904,² can be rapidly done under cocaine with special punch forceps, and causes little disturbance, while the pain is much relieved and seldom again becomes severe. In other cases, in which the pain is caused by great arytenoid swelling, the removal of a small piece with a punch causes the entire mass to shrink, and greatly

¹ Barwell, H. : *Hospital*, November 21, 1908, p. 189.

² Barwell, H. : *Lancet*, 1906, vol. ii., p. 1277.

improves the dysphagia; the wound usually heals rapidly even in the midst of tuberculous infiltration. Where the upper aperture is extensively ulcerated and destroyed, pain can be relieved by injection of alcohol into the superior laryngeal nerve of one or both sides;¹ 2 grains of β -eucaine hydrochloride in an ounce of 80 per cent. alcohol are used, and of this solution 1 to 2 c.c. are injected into the site of the nerve in the thyro-hyoid space, at a depth of about $1\frac{1}{2}$ centimetres, with an obtusely-pointed Schlösser's needle. Considerable relief follows a successful injection, but its duration is very variable, and recently French workers have practised division of the nerve through an open incision under local anaesthesia,² taking care to avoid the external branch to the crico-thyroid muscle.

THE DOMICILIARY TREATMENT OF TUBERCULOUS PATIENTS.

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THE allocation of so large a portion of the Sanatorium Benefit Grant of the National Health Insurance Act to the domiciliary treatment of tuberculosis has, unfortunately, curtailed in many instances the provision of "hospital beds" for advanced cases, with a result that infective persons are being largely treated in houses where any degree of isolation is impossible, and where the risk of infection to others is great. For this reason a State subsidy so generous for domiciliary treatment may well prove a hindrance rather than a help when viewed from the standpoint of preventive medicine. It is well for authorities undertaking the treatment of consumptives to realize that it is more important to provide beds for the isolation and education of infective persons with advanced disease, than to build and maintain sanatoria for the treatment of those early cases who, quite frequently, are suitable for ambulatory treatment. Until efficient measures are adopted for the segregation of the former group of patients, dissemination of tuberculous disease will continue. The fact must never be overlooked that prevention is better than treatment.

¹ Grant, J. Dundas: *Lancet*, 1910, vol. i., p. 1754.

² Chalié and Sonnet: *Presse Médicale*, 1912, p. 931.

Cases Suitable for Home Treatment.

In the choice of patients for home treatment great discrimination must be used, particularly in dealing with cases living in artisans' dwellings. It is, indeed, undesirable to treat any advanced infective case of consumption at home, of whatever social status, unless a certain amount of effective isolation and supervision can be obtained. This need not be so complete, of course, as that necessary in dealing with cases of the acute specific fevers, but must be sufficient to exclude the risk of infection to others.

Home treatment is suitable for those who have previously received treatment in a sanatorium, and who should, therefore, understand its meaning. It is indicated for those with early non-infective disease who are able to follow their occupation, and it is advisable, and frequently very successful, for those so placed that they have ample garden space, a bedroom to themselves, and a proper food-supply, particularly in the case of some female patients who dislike the separation from home surroundings required by residential treatment in an institution. For advanced infective bedridden patients in small dwellings it is certainly contra-indicated, both in the interests of the patient and his relatives. Too frequently, unfortunately, it is this latter type of case which we find receiving home treatment, because he is too advanced for out-patient or sanatorium treatment, and because many authorities undertaking the provision of treatment have failed to equip a sufficient number of beds for this purpose.

Educational Measures in Home Management.

It is well to remember that no treatment for pulmonary tuberculosis can be entirely satisfactory unless it includes education in general hygiene, efficient ventilation, sputum destruction, consideration of economic food values, and, where necessary, plain cooking. This education of the patient is frequently a matter of difficulty. It should be undertaken in sanatoria, anti-tuberculosis dispensaries, out-patient departments, by tuberculosis nurses and health visitors. It is constantly necessary to impress upon patients the fact that draughts and even damp cold air, will not give them "colds," and that fresh air can be obtained in a room with an open window, it being inadvisable to walk out of doors after the day's work, when weary and tired, to obtain it. Patients need much training also before they realize that good food does not necessarily include beef-tea, "nourishing" stout, and medicated wines, etc. The most difficult task of all, perhaps, is to instruct the consumptive that his treatment does not end with the time spent in the sanatorium or while attending an out-patient department. If he desires to maintain a fair measure of comparatively good health, it is well to insist that he or she follows a regulated life for an indefinite

period, and it must never be forgotten that pulmonary tuberculosis, in some of its forms, is one of our most chronic diseases. Disregard of this fact will lead to relapses.

Sleeping Accommodation under Home Conditions.

In the home treatment of pulmonary tuberculosis the provision of suitably ventilated sleeping accommodation is often a matter of difficulty. Where there is sufficient garden or yard space for the accommodation of a small chalet containing a camp-bed in which the patient will sleep, the difficulty can be overcome; but in the poorer parts of our large cities houses with gardens, or even yards, are rare. In congested urban districts the provision of proper sleeping accommodation for consumptives undergoing treatment has become imperative, and might be relieved or overcome by erecting cheap temporary buildings in different localities, where a bed could be obtained and the night spent under hygienic conditions. When sanatoria are erected in close proximity to towns—and this is now not uncommon—a “sleeping centre” or “night-camp” might be established in its grounds. It is always desirable that the consumptive should have a bedroom to himself, if possible. When he is infective he *must* have a bed to himself. This is a precaution of great importance, especially amongst children and adolescents, where overcrowded sleeping accommodation is more usual than is the case amongst adults. Examination of the clinical records of 1,000 patients treated in the Birmingham City Sanatoria showed that no less than 45 per cent. had brothers or sisters who were suffering from, or had died as a result of, tuberculosis.

The Employment of Domiciliary Cases.

Whenever possible, it is desirable that the consumptive should continue his occupation. Acting upon the medical advice given to him, and following his own instincts in too many instances, he discontinues his work unnecessarily, and the resulting state of semi-starvation aggravates his disease. Detection of the physical signs of pulmonary tuberculosis must not invariably be considered an excuse sufficient for the cessation of employment. In many instances, particularly where no residential treatment is being given, the patient can work whilst being treated. Too frequently, when a patient is notified, he not only discontinues work, but also neglects to make an application for treatment until his sickness benefit is exhausted, and subsequently refuses residential treatment because the amount of aid that can be offered to his family is insufficient for their maintenance. The commencement of treatment should be coincident with the commencement of full sickness benefit. Speaking generally, it is unwise for the adult consumptive to change his occupation unless it is an unhealthy or dangerous one,

nor should he discontinue his occupation before finding that "healthy open-air job" which is frequently sought after in vain! It is most important that he should earn the highest possible wage, and so insure a good food-supply; and it is reasonable to assume that a man's earning capacity is best in the occupation to which he is accustomed, so unless this can be increased by a change, and excepting in the case of employments which are particularly unhealthy, it should not be advised. It is a good plan, when possible, to provide patients with a certificate stating that they are free from infection. If this were done more generally, we should hear less of the difficulty experienced in obtaining work during and after treatment.

Sputum Destruction in Home-treated Cases.

The proper collection and destruction of sputum is a subject which must always receive the most careful consideration. The consumptive must be taught to expectorate into some special utensil reserved particularly for the purpose. For such cases as are bedridden, a small-sized earthenware jam jar covered with the lid of a soft-soap tin, containing a 1 in 50 solution of Izal, will be found suitable. In addition a large bib should be tied round the neck and spread out over the bed-clothes for a distance of 2 feet, having been previously wrung out in a 2 per cent. solution of formalin, this prevents contamination of the bed-linen. For those who require a pocket-flask, small tin canisters in which mustard, cocoa and tobacco have been packed can be utilized, if lined with a double thickness of brown paper and partially filled with sawdust. They have the advantage over the glass pocket-flask that they do not crack when dropped or when placed in boiling water. If it is inconvenient to use a pocket-flask, small squares of thin paper may be used for expectoration, if, after use, they are placed in a pocket having a detachable jaconet lining which can be wiped over with a disinfectant solution at the end of each day. Blankets, sheets, pillow-cases, nightdresses, and handkerchiefs, used by a consumptive who has either cough or expectoration should be soaked in a disinfectant solution for some hours before entering the household wash. Personal clothes and all bedding should be thoroughly disinfected before being used by others. Books, magazines, and papers, which have been used by a consumptive who coughs should always be destroyed, and never used by others.

DISCIPLINE AND RECREATION IN THE SANATORIUM.

By WILLIAM J. COX,

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THE maintenance of strict discipline in the sanatorium is of the utmost importance if routine of treatment is to be successfully carried out. At the same time, adequate and suitable means of recreation must be provided, as such are essential to promote that equanimity and content which assist so much in the patients' recovery. These two propositions may be taken as complementary. The first is absolutely essential, whilst the second is a necessary concession, to act as a slight relaxation from the somewhat monotonous nature of the course of treatment. The long period of convalescence in most cases of pulmonary tuberculosis is one in which many sanatorium patients feel in excellent health long before health is fully re-established. Hence the need for discipline, so that the patient may be induced to persevere.

It has been laid down by Vere Pearson¹ that the medical officer of a sanatorium must be an autocrat. This is quite correct. It will be found in practice that this attitude is necessary and also successful, provided that common sense and tact are also exercised. It is also necessary to have the co-operation and goodwill of the patients, which can easily be obtained if the objects of the methods of treatment are explained. As a rule patients do not resent a mild tyranny for their own good, if it is administered in a reasonable manner, although some, when they first arrive at the sanatorium, may not at first settle down to the discipline. Many difficulties are doubtless due to modern tendencies towards indiscipline, which are shown by a disinclination to submit to a routine which is in the least degree irksome. In most sanatoria the medical superintendent has full power to discharge a patient whose conduct is unsatisfactory. This is a wise provision, as the possession of this power is in itself a considerable moral force. It will sometimes be found necessary to exercise this power, particularly for the exclusion of individuals whose presence is harmful to the rest of the community. Offences such as breaking bounds in order to visit a public-house, gambling, or smuggling alcoholic drinks into the institution cannot be treated with leniency. The usual penalty is the expulsion of offenders. For small offences lesser penalties may be inflicted.

¹ Pearson, V.: "The State Provision of Sanatoria." Cambridge: University Press. 1913. Price 3s. net.

In those sanatoria where patients are allowed walks on the roads in the neighbourhood, the penalty of "gating" (confinement to the grounds) is sometimes inflicted. The question of "bounds" for the patients is one which will be decided according to local circumstances. At sanatoria where there is a town or village in the immediate vicinity restriction of bounds will be found necessary, owing to the opportunities which exist for entering public-houses and other places of resort. If the sanatorium is situated in a suburb or residential district the local residents will soon protest very loudly if patients are allowed liberty of the roads, and will probably write letters to the local papers making extraordinary statements about the dangers of infection to which they think themselves exposed. In a district which is sparsely populated walks may be planned along routes on which villages do not occur, and where houses are few. Where local circumstances do not permit this course, and where large grounds are available, routes may be planned out in the grounds, but unless the grounds are fairly extensive this keeping to the track will prove monotonous for the patients. There is, however, an advantage in this last procedure which is partly compensatory in that it makes better supervision of the exercise of the patients possible.

The question of separation or intermingling of the sexes in a "mixed" sanatorium is one which is usually decided by complete separation, except in private sanatoria. Two separate communities are commonly provided for, more or less under the same roof perhaps, and in many cases using a common dining-hall, but each having its separate social life. Most authorities appear to consider that this is the easiest and safest arrangement. Others, however, consider that a common social life for both sexes is a more successful and normal arrangement. One needs to have experience of both systems before pronouncing an opinion on the matter, but the writer's experience has been confined to the system of complete separation.

In planning out the daily routine for the patients, it is advisable to arrange the time-table so that time does not hang heavily on their hands. The time occupied by rest fills up much of the time-table in many sanatoria, especially when this is arranged in periods of half-hours before and after each meal. Occupation in the form of manual work is necessary for those patients who are in a comparatively early stage of the disease, in order to combat the slackness and inertia which arise in the absence of some form of muscular exercise apart from that of taking walks. The results of this form of treatment are excellent, physically and morally.

The recreational side of sanatorium life must also be well provided for. Recreation should not be made too prominent a feature, but it will serve to fill in the time at the end of the day when the routine

occupations of the sanatorium have had their due. Recreations, like exercise, need to be carefully graded according to the resistance of the patient to auto-inoculation, and according to his temperament and mental characteristics. Draughts and dominoes will be quite sufficient for many patients; others may be allowed to play billiards, bowls, skittles, croquet, quoits, and clock-face golf. Card games are usually prohibited as facilitating the practice of gambling, although the inveterate gambler finds it quite an easy matter to gamble in other ways. The monotony of sanatorium routine may be occasionally enlivened in other ways by the holding of concerts and lectures for the patients. It will usually be found that a few of the patients take an interest in some branch of natural science. Their interest may be stimulated, and perhaps others may be encouraged to take up such hobbies by lectures on the wild-flowers and birds of the district. Excursions by motor-waggonette are useful to give the patients a change of air and scene. The distance covered should not be too great, or fatigue will be caused by the vibration of the conveyance. It is, of course, necessary to select carefully the cases for such excursions.

A NOTE ON APPARATUS AND TECHNIQUE FOR THE PRODUCTION OF ARTIFICIAL PNEUMOTHORAX.

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of the Chest.

In view of the occasional difficulty experienced in country sanatoria of obtaining compressed gas cylinders, and of the frequent leakages that occur owing to insecure closure, I have recently devised an apparatus for the production of artificial pneumothorax, based on that of Dr. de Carle Woodcock of Leeds. In his appliance nitrogen is used, which is obtained by passing air by aspiration through a concentrated solution of pyrogallic acid in caustic potash. I have added a source of oxygen, also prepared by the apparatus, by the addition of a three-necked bottle, into which is introduced a catalytic agent in the form of peroxide of manganese and a solution of perborate of soda. The apparatus as completed is made by Messrs. Reynolds and Branson of Leeds, who also supply that suggested by Dr. Woodcock, and was demonstrated by me at the Leeds Tuberculosis Conference. It consists of a bottle for oxygen, a bottle for nitrogen, the corresponding bottles for the

preparation of these gases, Dr. Woodcock's admirable "safety-valve" manometer, and a reservoir bottle. The apparatus is on a stand, which is removable from the case for use. This is a very open and convenient arrangement in practice, and yet the apparatus is readily replaced in its case without disconnecting a single tube. It is here illustrated (Fig. 1). The nitrogen bottle is charged by first filling it with water by elevating the reservoir bottle. Then the tap is opened on the bottle for the aspiration of air through the pyrogallic acid solution, so that, when the reservoir bottle is now lowered, air deprived of oxygen

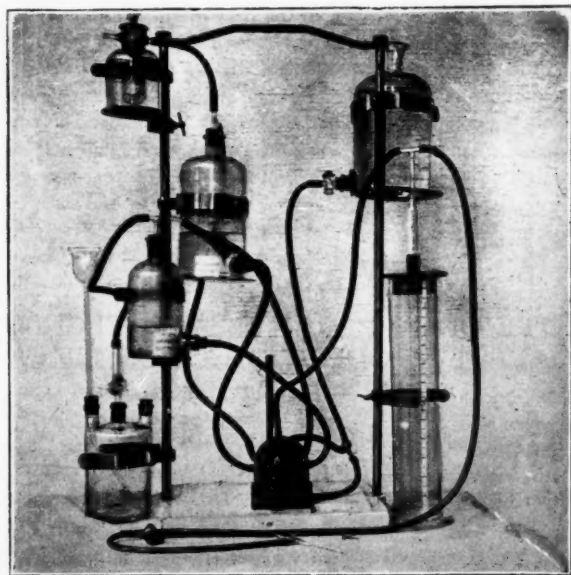


FIG. 1.—DR. LISTER'S APPARATUS AS DEMONSTRATED AT THE LEEDS CONFERENCE.

and carbonic acid gas—in other words, nitrogen—collects in the nitrogen bottle. When this is filled, the tap on the pyrogallic acid bottle is closed. In filling the oxygen bottle a charge of peroxide of manganese is first introduced through one neck of the three-necked preparation bottle, and this neck then closed. On the middle neck is fixed a two-way tap, one direction communicating with the air, the other with the oxygen bottle. This tap is turned so that the interior of the bottle communicates with the air. A solution of a charge of perborate of soda in water at about 70° C. is then poured down the thistle funnel in

the third neck till the bottle is nearly full. Effervescence of nascent oxygen at once begins, and washes out any air contained in the upper part of the bottle through the tap in communication with the atmosphere. The oxygen bottle, which has previously been filled with water by raising the reservoir bottle, is now filled with oxygen by turning the tap in the preparation bottle so that it communicates with the oxygen bottle, and the reservoir is lowered. It is necessary to watch the oxygen preparation bottle at this stage to see that the pressure of the nascent oxygen is not too great for fluid to be forced up over the top of the thistle funnel, and, on the other hand, that the reservoir is not lowered so far that a negative pressure causes air to be aspirated down through the thistle funnel. The first difficulty is instantly corrected by turning the two-way tap in the middle neck of the preparation bottle so as to allow some of the oxygen to escape into the air, the second by

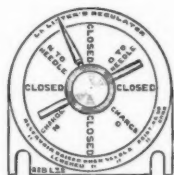


FIG. 2.—FRONT VIEW
OF DR. LISTER'S
REGULATOR.

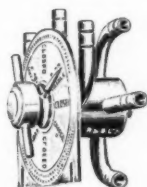


FIG. 3.—SIDE VIEW
SHOWING WATER AND
GAS CONNECTIONS.

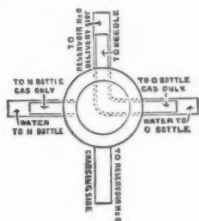


FIG. 4.—DIAGRAM OF
CONSTRUCTION.

slightly raising the reservoir bottle. When the oxygen bottle is filled, the two-way tap is turned so that it communicates with the atmosphere. The nitrogen and oxygen bottles could, of course, be filled from gas cylinders without the use of the gas preparation bottles by means of the ordinary gas cylinders when these are available. When the gas bottles are filled with oxygen and nitrogen respectively the apparatus is ready for use. At the first operation it is advisable to use oxygen to commence the formation of the artificial pneumothorax. It is therefore well, before inserting the needle into the chest, to run a certain amount of oxygen through the manometer and needle so that oxygen escapes freely from the needle. About 50 c.c. of oxygen are sufficient to wash out the apparatus.

The many controls necessary in the usual forms of apparatus which supply both gases at will to the needle, have also been abolished by an addition I have designed. The gas-tubes from the oxygen and nitrogen bottles, the gas delivery tube to the T-piece on the manometer, the water-tubes from the gas-bottles and reservoir, are all brought to a

single controlling regulator of special design fitted with a pointed indicator. This has also been made for me by Messrs. Reynolds and Branson, and is here illustrated (Fig. 2).

The whole flow of gas and water in every direction is controlled by one tap, with a pointer on an indicator showing what is taking place. By turning this indicator, for instance, to "N to needle," as marked on the dial of the regulator, water is turned from the reservoir to the nitrogen bottle, and gas from the nitrogen bottle to the needle. Whenever the pointer is pointing to the word "closed," the needle in the patient's chest is only in communication with the manometer.

When the pointer is pointing upwards, the reservoir bottle has to be raised above the level of the gas bottles, and *vice versa*.

The pressure at which gas flows from the gas bottles into the chest is shown by the manometer when the pointer on the indicator is at "N to needle" or "O to needle," as the case may be. The pressure attained in the chest at any moment is shown by putting the pointer to "Closed." Should it be necessary to use more than one bottle of nitrogen during a refilling of the chest, the needle in the chest need not be disturbed, and by turning the pointer downwards to "Charging with N," and lowering the reservoir bottle, the nitrogen bottle can be

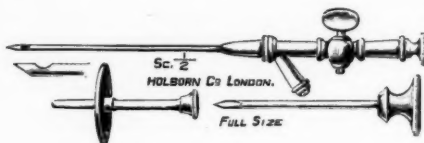


FIG. 5.—DR. LISTER'S NEEDLE.

recharged by opening the tap admitting air to the bottle containing the pyrogalllic solution. During the recharging the needle in the chest is only in communication with the manometer, and directly the nitrogen bottle contains enough nitrogen to continue the filling of the chest the tap on the pyrogallate bottle is closed, the reservoir raised, and the pointer on the regulator again turned to "N to needle." In this way a multiplicity of taps is entirely eliminated and one tap controls the apparatus, turning the water in either direction between the gas bottles and the reservoir, closing the needle during recharging the gas bottles or at any moment, and controlling immediate change to either gas during the filling of the chest. This regulator, it is hoped, will prove of assistance in enabling the operator to devote his whole attention to watching the manometer, which is in communication with the needle in the chest.

To diminish the risk of puncture of the lung to a minimum, I have

also had made for me by the Holborn Surgical Instrument Company a semi-blunt needle, of small calibre, with a lateral aperture very close to its point (Fig. 5). This needle is introduced through a little silver cannula guarded by a flat plate one-quarter of an inch from its end, which is introduced by means of a sharp trocar through the skin and superficial tissues in the intercostal space. The trocar is withdrawn, leaving the little cannula fixed in the superficial tissues. The hollow, semi-blunt needle is then introduced through the cannula, which it fits, and is sufficiently sharp to pierce the less resistant fasciæ and pleura. I have several times found difficulty in the use of rather small needles with a terminal aperture, and prefer the lateral opening.

Although it is impossible to guard absolutely against risk in the operation for producing artificial pneumothorax, yet simplification of control of the hydrostatic apparatus for the transfer of gas to the chest, and the substitution of a semi-blunt needle introduced through a guarded cannula, may help single-handed operators and make for safety.

INSTITUTIONS FOR THE TUBERCULOUS.

IRELAND is coming into her own. Certainly marked progress is being made in matters relating to the hygienic and social well-being of its

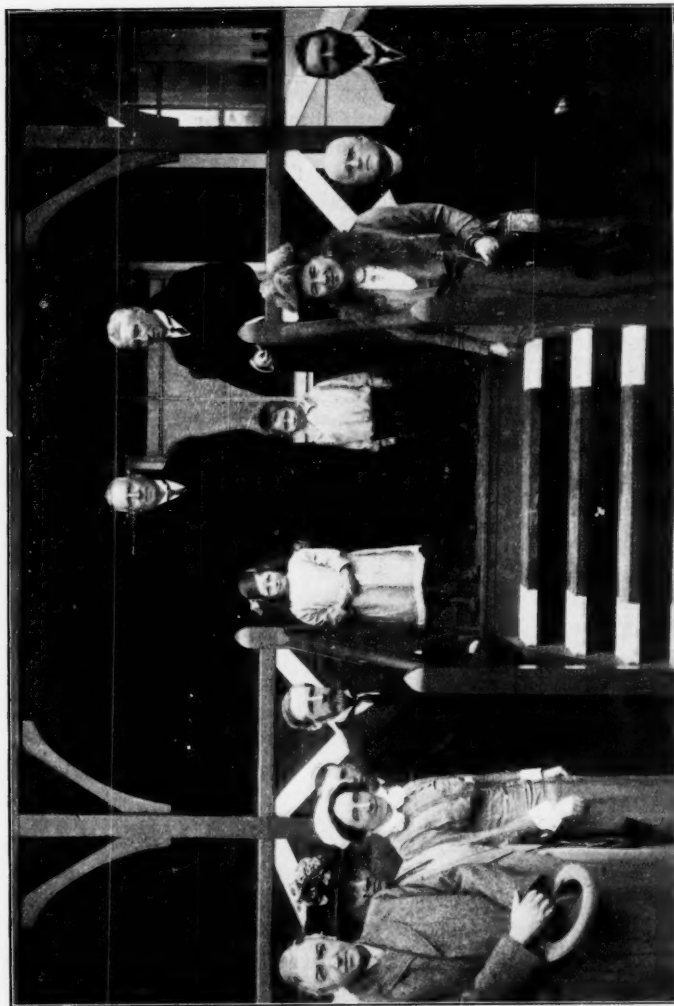


Photo by

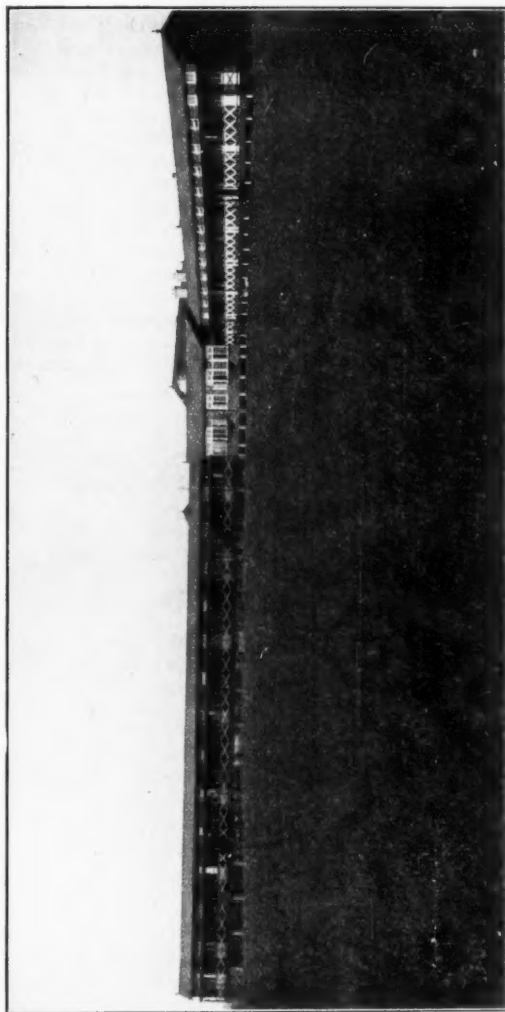
THE OPENING OF THE CHILDREN'S PAVILION AT PEAMOUNT BY THE PRIME MINISTER, SEPTEMBER 26, 1914.

The Prime Minister and Dr. Hanley, C.M.G., with the two youngest children, Billy Doolin and Dolly Lyons.

Professor McWeeney. Miss Brennan. H.E. The Lord Lieutenant. H.E. The Countess of Aberdeen. Fr. Hurley, F.P. Sir William Thompson.

[Holmes.

people, and particularly of its children. The splendid development of anti-tuberculosis measures during recent years is in great measure due



[Holmes,

Photo by]

THE NEW CHILDREN'S PAVILION AT PEAMOUNT SANATORIUM, IRELAND.

to the wise encouragement of Their Excellencies the Lord-Lieutenant of Ireland and Lady Aberdeen. Lady Aberdeen, through the instrumentality of the Women's National Health Association of Ireland, and

with the support of a number of leading Irishmen and Irish women and well-known medical leaders, has accomplished a noble service for the children of Ireland. In the accompanying illustrations we are able to give some idea of the new Children's Pavilion at the Peamount Sanatorium, which was opened by the Prime Minister on September 26 last. This establishment for young tuberculous and tuberculously disposed cases is the first of its kind in Ireland, and marks the beginning of a new era in child welfare. The Children's Pavilion at Peamount was erected on the initiative of Her Excellency the Countess of Aberdeen, as there is no institution in Ireland for treating children with pulmonary tuberculosis. The Pavilion has been specially designed for children. It is self-contained and most complete in every way. It will accommodate between fifty and sixty children. It is proposed to have an open-air school in connection with the Pavilion, established under the Commissioners of National Education. It is also the intention of the management to clothe the children. A slight extra charge will have to be made for these purposes. Children have done so well as patients at the ordinary sanatorium at Peamount that it is anticipated that, when they are gathered together in their own Pavilion and have special educational and other advantages, that the results will be most gratifying.

NOTICES OF BOOKS.

OPEN-AIR EDUCATION AND TREATMENT.

THIS is undoubtedly the century of the child, but it is only after the perusal of such a work as the newly issued "Year-Book of Open-Air Schools and Children's Sanatoria"¹ that one fully realizes the immense amount of well-directed energy that is now being expended for the benefit of the children of the nation. The fact is being more and more appreciated by medical experts that, in order to effect a permanent improvement in the physique and health of the population, it is necessary to begin by improving the environment of the child. We have learnt that many morbid processes start in childhood, and that the seedlings of tuberculosis and other diseases are frequently then present in a semi-latent form, tending, under favourable conditions, to a spontaneous cure; but, on the other hand, destined, in an unfavourable environment, to resume activity and lead to permanent disability, if not to incurable disease and premature death. These morbid processes are in many instances directly traceable to defective dietetic or hygienic conditions. It has been the study during the past two decades of the causal factors affecting the incidence of tuberculosis that has led to the valuable discovery that daily open air is the key to health, and that in particular it is all essential for the physical well-being of children. Hence the growing demand for open-air schools and children's sanatoria, and the enthusiasm of our hygienic experts and higher educational authorities in regard to the benefits accruing to tuberculously disposed and other delicate children from daily attendance at, or residence in, such institutions. A knowledge of these facts, however, is still the possession of the few, and it is most important to extend this knowledge to all local educational and health authorities in rural and urban districts, and also to the general public, who are so immediately concerned. It would be impossible to devise a better method than the publication of the new "Year-Book," which embodies all the most recent information on the subject. This volume is, however, in no sense a mere compendium of carefully tabulated facts, though these are given in comprehensive detail, but it contains interesting and instructive information regarding the history and progress of the whole open-air movement as applied to the needs of children. The Editor has succeeded not only in marshalling the facts as the result of personal investigation, but he has secured the co-operation of all the leading practical experts—hygienic, medical, educational, and architectural—the whole forming a most fascinating and comprehensive study. The "Editorial Review" refers to vital statistics connected with the incidence of tuberculosis in children, to grants-in-aid for providing sanatorium schools, the epitomized opinions of the principal medical officers of the

¹ "The Year-Book of Open-Air Schools and Children's Sanatoria." Edited by T. N. Kelynack, M.D. Pp. liii+444. With numerous illustrations. London: John Bale, Sons and Danielsson, Oxford House, 83-91, Great Titchfield Street, Oxford Street, W. 1915. Price 7s. 6d. net.

Education Board and London County Council in regard to the value of open-air schools and playground classes, and also indicates the principles which should guide local authorities in planning sanatoria for children. There are numerous original articles dealing with the manifold aspects of open-air education and treatment, and in which all the details, both of management and architectural construction, are carefully set forth. The importance of the personnel is also emphasized, and the special qualifications of nurses and teachers are carefully explained. Critical surveys are also presented dealing with various allied subjects, such as the Leysin sun-cure, recent methods in the diagnosis and treatment of tuberculous disease, the relation of bovine tuberculosis to child welfare, and other kindred matters. The various schemes proposed by the different urban centres and rural districts are also dealt with, and it is interesting to note that in more than one of these it is proposed to extend the scope of open-air educational institutions to the treatment of such conditions as enlarged tonsils, adenoids, glandular trouble, anæmia, rickets, mal-nutrition, bronchitis, rheumatism, heart affections, and functional neuroses. A special feature of the "Year-Book" is the large number of beautiful illustrations, which explain in the most graphic manner the various details connected with management, planning, and architecture of open-air schools and sanatoria. One cannot too strongly recommend the work to the careful perusal of all those who are interested in the welfare of the children of the nation.

R. MURRAY LESLIE, M.D.

HUMAN DERELICTS.

We are so familiar with individual specimens of the human derelict, and have seen so many efforts made to patch him up and bring him to port—efforts, in most cases, evidently doomed to failure from the outset, and even, in cases where they have been attended with some slight success, involving an amount of energy out of all proportion to the results obtained. In a work just issued, entitled "Human Derelicts," Dr. T. N. Kelynack has collected a number of articles by various writers, each a recognized expert on the subject on which he or she writes.¹ The editor has selected men and women who, with a full knowledge of their subject, combine powers of terse and lucid exposition in such degree that we have before us, in the space of a little over 330 pages, seventeen articles which, whilst painting the future of the human derelict in very sombre colours, give hope that something may be done to prevent the wreckage which at the present time accounts for the presence in our British social seas of over a million of such "wastrels." On perusing these articles dealing with lunatics, idiots and imbeciles, the epileptic, the inebriate, the criminal, the vagrant, the prostitute and the recidivist derelict, one is confronted by the fact that, although heredity plays a very important part in determining the erratic course of the human derelict, alcoholism, tubercu-

¹ "Human Derelicts: Medico-Sociological Studies for Teachers of Religion and Social Workers." Edited by T. N. Kelynack, M.D. With a Foreword by Sir Thomas Clouston, M.D., LL.D. Pp. xxii+341. London: Charles H. Kelly, 25-35, City Road, and 26, Paternoster Row, E.C. 1914. Price 5s. net.

losis, and syphilis, amongst them, account for this to a much larger extent; and even where heredity does play its part, these external factors seem to act as exciting causes, and to bring into greater prominence hereditary taints. Of course the converse holds good, that in certain cases the inebriate and the syphilitic have become inebriate and syphilitic largely because of their hereditary weaknesses. Both aspects of the case are put forward fairly and clearly in these articles, but there appears to be a consensus of opinion that alcoholism is, in a considerable proportion of cases at any rate, causal, and not merely sequential. One expects that men and women dealing with a subject in which shadow preponderates so largely over the lights would naturally take a gloomy view of it. If merely the finished article is considered, that is undoubtedly the outlook adopted, as all seem to agree that reclamatory efforts involve such an enormous expenditure of energy—energy usually wasted—that the procedure is uneconomical and gives promise of little hope of success. When, however, one turns to the two last chapters of the book, one on "Prenatal Influences," by Dr. J. W. Ballantyne, and the other on "Eugenics and the Human Derelict," by Dr. C. W. Saleeby, a much brighter vista is opened up, and we see that with all the other contributors these authors believe that much is to be hoped for from the exercise of preventive methods; and in this hopeful note are many harmonics. The work of the scientific organizer is reinforced by the labours of the social worker, the physician, and the clergyman, all of whom are harnessed tandem. However, the best thing a reviewer can do is to let the would-be reader know whether the book under review is worth reading or not, and in this case one can state very conscientiously that those who take an interest in human derelicts—and who that is a member of any large family or society does not?—will find in this collection of short essays clear and interesting accounts of the various types of derelict, and will gain some idea of how much may be done, not to diminish the number of the existing cases, but to prevent their being cast adrift on the modern social sea.

G. SIMS WOODHEAD, M.D.

TUBERCULOSIS OF BONES AND JOINTS IN CHILDHOOD.

During recent years much new light has been brought to bear on the problem of tuberculosis in early life. A particularly valuable contribution to the subject has just been published by Mr. John Fraser, Assistant Surgeon to the Royal Hospital for Sick Children, Edinburgh.¹ Mr. Fraser has had the advantage of working under the guidance of Mr. Harold J. Stiles, to whom the monograph is appropriately dedicated. The volume is the latest addition to the excellent "Edinburgh Medical Series," the general editor of which is Dr. John D. Comrie. Mr. Fraser's work is restricted to tuberculous disease of bones and joints as met with in childhood. The book is divided into two main sections; the first is devoted to a general consideration of tuberculous disease as it affects bones and joints, while the second deals with the various

¹ "Tuberculosis of the Bones and Joints in Children." By John Fraser, M.D., F.R.C.S.E., Ch.M., Assistant Surgeon, Royal Hospital for Sick Children, Edinburgh. Pp. xvi + 352. With 51 full-page plates (2 in colours), and 164 figures in the text. London: A. and C. Black. 1914. Price 15s. net.

forms of local tuberculous disorder. The portions dealing with the pathology of the disease are particularly admirable. The splendid series of illustrations of normal and pathological states deserve special praise. Edinburgh has provided much new light on the problems of tuberculosis, especially in regard to infection of human subjects with tubercle of the bovine type. Mr. Fraser claims, as the result of his own observations, that no less than 60 per cent. of his cases were due to infection from the bovine bacillus of tuberculosis, and with this he correlates an infected milk-supply, and the predisposition of bone and joint tissues in young subjects to tuberculous infection. Mr. Fraser holds that traumatism often plays a part in the initiation of the trouble. He thinks that, in regard to alimentary infection, the resistance offered by the mesenteric glands of a child is much less than that of an adult. The work throughout, while eminently scientific, is thoroughly practical. The descriptions of the various forms of so-called "local" tuberculous disease are excellent, and the directions for treatment are such as will be of interest to all surgeons, and will serve to direct all practitioners. Within the limits at our disposal it is impossible to give an adequate idea of the scientific importance and practical value of this notable book. It is the most up-to-date and suggestive work on the subject yet published, and should be studied in its entirety by all medical practitioners, and especially by those called to advise in regard to tuberculous children. A word of special praise is due to the publishers for the handsome way in which the volume has been issued. The general get-up is most satisfying, and the large number of well-prepared illustrations adds greatly to the value of the text.

MANUALS FOR MEDICAL PRACTITIONERS, AND WORKS OF REFERENCE.

A new edition has just been issued of the excellent Textbook of Pathology prepared by Professor J. George Adami and Dr. John McCrae.¹ This is a work for students of medicine which deserves to be used on both sides of the Atlantic. It is the most comprehensive, up-to-date, and generally serviceable volume for students, and deals with the essential facts and problems of pathology at present available. It is difficult to compress the fundamentals of a subject so vast as modern pathology into one volume, but the authors of this work have so classified, correlated, and condensed, as to produce a handbook which presents not only general laws of pathology, but affords information regarding most facts which have bearing on the practice of medicine. A good section is devoted to tuberculosis, and throughout the volume excellent descriptions are given of the various forms of tuberculous lesion met with in various regions of the body. The work is elabor-

¹ "A Textbook of Pathology for Students of Medicine." By J. George Adami, M.A., M.D., F.R.S., Strathcona Professor of Pathology, McGill University, and Advisory Pathologist to the Montreal General and the Royal Victoria Hospitals, Montreal, Canada; and John McCrae, M.D., M.R.C.P., Lecturer in Pathology and Clinical Medicine, McGill University, Montreal; Senior Assistant Physician, Royal Victoria Hospital. Second edition, revised and enlarged. Pp. viii+878, with 395 engravings and 13 coloured plates. London: Macmillan and Co., Ltd., St. Martin's Street, W.C. 1914. Price 25s. net.

ately illustrated, well printed on good paper, and there is a very full index.

Dr. John B. Hawes¹ has written a concise manual on the recognition and management of early cases of tuberculosis of the lungs, which will be appreciated by busy medical practitioners. As secretary to the Commission in charge of the four tuberculosis sanatoria maintained by the State of Massachusetts, he has had ample opportunity of studying the problem in all its bearings. As Dr. Richard C. Cabot indicates in his preface to the volume, it is "small and yet authoritative." It gathers together within reasonable compass essential points, and will prove of real service to busy practitioners for whom it has been written. The numerous illustrations add much to the helpfulness of the book.

Sir Almroth E. Wright's scientific researches and their application to practical medicine are known and appreciated throughout the world. In his latest volume, "On Pharmaco-Therapy and Preventive Inoculation,"² he furnishes "A Report to the Witwatersrand Native Labour Association upon a research which was undertaken under their auspices, and was directed to the discovery of some method of mitigating the ravages of pneumonia among the native labourers employed on the Rand mines." Sir Almroth holds that in such work "we have at disposal two methods of procedure: the *statistical method*, and that which I call the *experimental method*, or the *method of diacritical judgment*. And I believe I make good that this latter is logically justified, and that it ought not, either in medicine or those other sciences which are based upon cumulative experiments, to be supplanted by the statistical method." The volume explains how the *experimental method* was employed in evaluating a series of experiments made with pharmaco-therapy in pneumonia, and also with the *statistical method* in evaluating the mass-experiments made with vaccine-therapy and preventive inoculation against pneumonia. The monograph is a highly suggestive contribution to a scientific endeavour to solve a problem of the greatest importance to mankind and to industrial work in South Africa.

Dr. John Bessner Huber, author of "Consumption and Civilization," has sent us a delightful little volume of essays entitled "A Doctor's View-Point."³ There are twenty-eight essays, most of which appear to have been previously published in well-known American periodicals. The range of subjects covers a wide field and touches many problems relating to medicine and human betterment, as will be indicated by the enumeration of the titles of some half a dozen of the articles: "The Elimination of Tuberculosis," "Woman's Seven Ages," "Eugenics," "Psychic Research," "Consumption and Civilization," "The Philo-

¹ "Early Pulmonary Tuberculosis: Diagnosis, Prognosis, and Treatment." By John B. Hawes, 2nd., M.D., Assistant Visiting Physician, and Director of Tuberculin Department, Massachusetts General Hospital. With a Preface by Richard C. Cabot, M.D., Assistant Professor of Medicine, Harvard University. Pp. 114, with chart and illustrations. New York: William Wood and Co. 1913.

² "On Pharmaco-Therapy and Preventive Inoculation applied to Pneumonia in the African Native, with a Discourse on the Logical Methods which ought to be employed in the Evaluation of Therapeutic Agents." By Sir Almroth E. Wright, M.D., F.R.S. Pp. xii+124. London: Constable and Co., Ltd., 10, Orange Street, Leicester Square. 1914. Price 4s. 6d. net.

³ "A Doctor's View-Point." By John Bessner Huber, A.M., M.D. Pp. 164. New York: Gazette Publishing Company, 87, Nassau Street. 1914.

sophy of Prayer." The volume is just such a one as the weary doctor will delight to peruse at the close of a long day of strenuous duties.

A third edition has just been issued of the excellent manual on "Practical Nursing" written by Miss Anna Caroline Maxwell and Miss Amy Elizabeth Pope.¹ This work is one of the best books on nursing that has ever been written. It is a complete guide to the making of a perfect nurse. It deals with all the details of nursing, but it is more than a mere manual of directions, for it sets forth ethical principles and fundamental facts regarding conduct and other essentials in a nurse's career. The work is one which will be invaluable not only to women desirous of fully equipping themselves for the onerous duties of a member of the nursing profession, but will also be of much service to matrons of hospitals and sanatoria, and medical officers on whom devolve the responsibility of lecturing to nurses. The book is provided with charts and illustrations, and should be in the hands of all British and American nurses. At the present time this book will be of much help to members of the Red Cross and other nursing organizations.

All serious students of the tuberculosis problem should make themselves fully acquainted with the developments of town planning and improved housing, for we cannot expect to banish consumption and other forms of tuberculosis from our midst until we have secured better conditions for our community centres and more hygienic dwellings for the workers of our land. Much valuable information regarding proposals and movements for dealing with these matters will be found in the "Records of the Liverpool Exhibition,"² held last spring. This volume provides in concentrated form particulars of one of the most important schemes and experiments which are under consideration in this country. It is a volume which all medical officers of health and workers for civic advancement will do well to study.

Those responsible for the selection of sites for sanatoria and the construction of establishments for tuberculous subjects have to give consideration to many important matters, but one of the most vital is that relating to a proper water-supply. To all such we would commend the valuable "Studies in Water-Supply,"³ recently published by Dr. A. C. Houston. This monograph embodies the results of the author's researches and experience, and is no mere compilation of other men's work. It deals with the sources of supply, the question of abstraction, purification, sterilization, processes with particular reference to the "Excess-lime" method, and storage in relation to purification. There are also important sections on the relation of water to disease, the financial value of a pure water-supply, and bacteriological

¹ "Practical Nursing: A Textbook for Nurses." By Anna Caroline Maxwell, Superintendent of Presbyterian Hospital School of Nursing; and Amy Elizabeth Pope, formerly Instructor in Presbyterian Hospital School of Nursing. Third edition, revised and much enlarged. Pp. xv+873, with illustrations. New York and London: G. P. Putnam's Sons. 1914. Price 7s. 6d. net.

² "Liverpool Town Planning and Housing Exhibition: Transactions of Conference held March 9 to 13, 1914, at Liberty Buildings, Liverpool." Edited by S. W. Adshead and Patrick Abercrombie. Pp. 168, with plans and illustrations. Liverpool: The University Press, 57, Ashton Street. 1914. Price 7s. 6d. net.

³ "Studies in Water-Supply." By A. C. Houston, D.Sc., M.B., C.M., Director of Water Examination, Metropolitan Water Board. Pp. xii+203, with diagrams and illustrations. London: Macmillan and Co. 1913. Price 5s. net.

routine methods. There is much information of a thoroughly practical character. The volume is one of exceptional interest and value.

Tuberculosis nurses are now forming a special section of workers in the nursing profession, and are receiving suitable training for dealing with consumptives and other classes of tuberculosis. Those responsible for the training of tuberculosis nurses will find the collection of studies, each contributed by an expert, recently published by the Municipal Tuberculosis Sanatorium Department of the City of Chicago, of much practical service. The volume has been issued for "Nurses' Tuberculosis Study Circles,"¹ and contains "Historical Notes on Tuberculosis," by Rosalind Mackay; "Visiting Tuberculosis Nursing in Various Cities of the United States," by Anna M. Drake; "Provisions for Out-Door Sleeping," by May MacConachie; "Some Points in the Nursing Care of the Advanced Consumptive," by Elsa Lund; and "Open-Air Schools in this Country and Abroad," by Frances M. Heinrich. Dr. Theodore B. Sachs also provides a section entitled "Notes on Tuberculin for Nurses."

In many parts of the country comprehensive schemes have been arranged for dealing with the tuberculosis problem in all its main bearings. The county of Lanark² has accomplished, under the direction of Dr. John T. Wilson, excellent work in dealing with tuberculous subjects, and its recently issued report is a model one, which all tuberculosis officers would do well to study.

At the present time comparatively few have opportunity or inclination for a resort to winter health stations, although we understand that resorts along the French and Italian Riviera, as well as other centres in Spain, Italy, and elsewhere along the Mediterranean, are prepared to cater for the needs of invalids and delicate or aged persons for who an escape from the winter winds, cold rain, and irritating fogs of the north is desirable. Anyway, Mr. Eustace Reynolds-Ball has with hope and courage issued the seventh edition of Vol. I. of his well-known "Mediterranean Winter Resorts."³ The book is one which medical advisers and also patients proposing to go south will do well to possess.

All photographers should procure and use the excellent "Record and Diary" supplied by Messrs. Burroughs Wellcome and Co.⁴ It is a pocket-sized volume, with all sorts of practical information regarding exposures, development, and the like, and well-arranged pages for diary and memoranda.

¹ "Nurses' Papers on Tuberculosis Read before the Nurses' Study Circle of the Dispensary Department of the Chicago Municipal Tuberculosis Sanatorium." Pp. 66. Chicago: Municipal Tuberculosis Sanatorium, 105, West Monroe Street, 1914.

² "County of Lanark: Tuberculosis Prevention, Detection, and Treatment, Annual Report for 1913." By the Medical Staff. Pp. 342. Glasgow: Robert Anderson, 142, West Nile Street, 1914.

³ "Mediterranean Winter Resorts: A Complete and Practical Handbook to the Principal Health and Pleasure Resorts on the Shores of the Mediterranean, with Special Articles on the Principal Invalid Stations by Resident English Physicians." By Eustace Reynolds-Ball, F.R.G.S. Pp. 635. With a map of the Mediterranean and several diagrams. Vol. I., South Europe. Seventh edition, revised and in part rewritten. London: Kegan Paul, Trench, Trübner and Company, Ltd. 1914. Price 5s. net.

⁴ "The 'Wellcome' Photographic Exposure Record and Diary for 1915." London: Burroughs Wellcome and Co. Price 1s. net.

PREPARATIONS AND APPLIANCES.

AN ELECTRIC HEATER.

ELECTRIC energy is being used extensively, not only for lighting, but for radiators and for heating purposes. Most sanatoria and hospitals, and many private houses, are now equipped with plant for the generation of electric current. All possessing such will do well to make the acquaintance of the new **BASTIAN PATENT PYGMY HEATER**.¹ The chief features and general form of this practical appliance are shown in the accompanying figure. This little apparatus will be found of



THE BASTIAN PATENT PYGMY HEATER.

much service for the heating of water for hot-water bottles of every kind, the preparation of fomentations, warm drinks, or hot shaving-water. It will serve to keep food hot, and can be employed for the boiling of eggs, the toasting of cakes, or the sterilization of instruments. Its original cost is small (8s. 9d. complete), and the expenditure in current is insignificant. The heater can be supplied with the same current as that used for illumination, and can be fitted into any lamp-holder.

THE COLLECTION OF BLOOD-SPECIMENS.

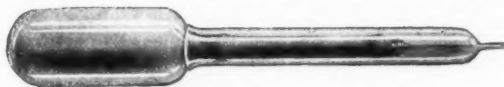
In the clinical investigation of many forms of disease, it is necessary to collect a specimen of the patient's blood. The difficulties of this procedure are now reduced to a minimum by the introduction of the "**HYPOSOL**" IMPROVED VACUUM EXTRACTOR.² The general character of this ingenious contrivance is indicated in the accompanying illustration.

The extractor consists of an exhausted and sealed glass phial attached by means of a piece of pressure tubing to a hypodermic needle. The neck of the phial and the needle are protected by a glass cap, and the whole apparatus is sterile ready for use. The skin over the vein selected for puncture is sterilized, and the vein distended by applying pressure in the usual way. The protecting cap is removed, the wire

¹ The Bastian Patent Pygmy Heater (improved pattern) is manufactured by the London Electrical Trading Company, Ltd., 185, Wardour Street, London, W.

² The "Hyposol" Extractor is supplied by Messrs. Allen and Hanburys Ltd., 7, Vere Street, London, W. Price 1s. 3d. each.

withdrawn from the needle with sterile forceps, and the needle inserted into the vein pointing along its course. The needle is moved slightly in and out to ascertain that the point is free in the lumen of the vein, and the neck of the phial is broken near the point, between the finger and thumb. The blood then flows slowly into the phial. When it has ceased to flow, the needle is withdrawn, the ligature which attached the rubber tubing to the phial is cut, the tubing removed, and the open end of the phial sealed in a hot flame. The bulb of the phial has a total capacity of 25 c.c., and is made to fit the Martin centrifuge. As

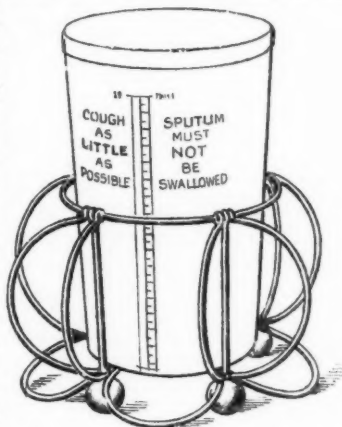


THE "HYPOSOL" VACUUM EXTRACTOR.

usually supplied, the phial contains 1 c.c. of a 10 per cent. solution of sodium citrate. The citrate solution may be omitted if it is not desired to prevent coagulation, or the phial may be made to contain a few glass beads for purposes of defibrination. The apparatus may also be obtained in a modified form in which the blood is drawn directly into nutrient bouillon or citrated normal saline. In this form the phial has a total capacity of about 65 c.c., and contains 50 c.c. saline or bouillon. In both forms of the apparatus the degree of vacuum is such that 10 c.c. of blood are drawn. The second form is preferable for bacteriological examinations, on account of the possible bactericidal effect of undiluted blood.

A NEW SPUTUM CUP-HOLDER.

Dr. H. C. Symes Thompson has sent us particulars of a new SPUTUM CUP-HOLDER, the chief features of which are indicated in the accompanying figure. The holder, which was originally designed for use at the Royal Hospital for Diseases of the Chest, City Road, London, is a structure made of wire resting on steel balls. A waxed paper cup, which is provided with a cover of similar material, fits into the holder, the paper cup and its cover being replaced each day.¹ The following advantages are claimed for the invention: (1) It cannot be upset owing to certain wire loops and its low centre of gravity. (2) There are four double handles; firmness and facility of grip are thus assured. (3) It is easily sterilized. The following disadvantages, which attend china and metal cups, are avoided by its use: (1) The process of sterilization of china and metal cups entails several



¹ The Sputum Cup-Holder, which has been provisionally protected at the Patent Office, is made by Messrs. H. F. Angus and Co., 83, Wigmore Street, London. The waxed paper cups are made by the Mono Service Vessels, Ltd., Park Royal, London.

stages, and danger of dissemination of infective organisms at each stage. (2) During cleaning the finger may be inoculated with disease, particularly when the cups are chipped or bent. (3) An expensive sterilizer is required. Paper cups do not suffer from these disabilities, because the soiled cup is simply put into the furnace with its contents. When used alone they are, however, open to the objection that they are easily knocked over.

A NEW HEAD PROTECTOR.

During the last few months our sailors and soldiers have testified to the value of protectors for the head. Immense numbers of woollen helmets have been provided for the troops. A new form of head protector, neat in form, light in weight, and exceedingly comfortable,



THE CAP-COMFORTER.

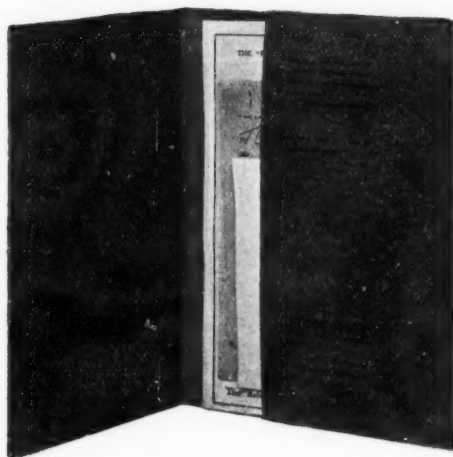
has recently been introduced by Mr. Fred Winter. This form of CAP-COMFORTER is admirable for all needing warmth and protection for the head, and is particularly well suited to the requirements of patients undergoing open-air treatment.¹

FILES FOR CASE PAPERS.

Tuberculosis officers and medical superintendents of sanatoria have need of effective time- and labour-saving contrivances for the safe and orderly classification of records of cases. All such may be directed to the convenient files introduced by Messrs. John Morgan Richards and Sons, Ltd. The BOX FILES, fitted with folders, will be found excellent for the grouping of clinical records, charts, letters, etc., or for the

¹ The Cap-Comforter is supplied by Mr. Fred Winter, 16-18 and 31, High Street, Stratford-on-Avon.

convenient classification of reports and pamphlets, or memoranda of all kinds. Ingenious forms of EXPANDING FILES have also been introduced to aid doctors engaged in duties in connection with National Insurance



FILES AND FOLDERS FOR CASE PAPERS.

work. These files will take as many as 520 cards, which can be retained in alphabetical order.¹

¹ Full particulars regarding the above Files may be obtained on application to Messrs. John Morgan Richards and Sons, Ltd., 46, Holborn Viaduct, London, E.C.

A convenient form of SANATORIUM CASE REGISTER has been designed by Dr. G. M. Mayberry, Resident Medical Officer of the Dagenham Sanatorium, Essex.¹ The Register sheet measures 23 inches by 11 inches. The left half is arranged for a complete record of the patient, including Family History, Previous Illnesses and Treatment, Signs and Symptoms of Present Illness, General Appearance, etc. The lower portion of one side is occupied with diagrams of thorax (front and back), for recording physical signs on admission and on discharge, diagrams of the larynx, spaces for temperature, weight, pulse, etc. The opposite page is provided for notes, and space is also allowed for after-history. Each sheet is printed on both sides, and when bound in books each opening shows a complete record of the case.

NEW PHARMACEUTICAL AND THERAPEUTICAL PREPARATIONS.

Iodine has come into high favour, and is certainly one of the most valuable of drugs. A very convenient form of the spirituous solution may now be obtained as "VAPOROLE" TINCTURE OF IODINE, supplied by Messrs. Burroughs Wellcome and Co.² The use of tincture of iodine as a first field dressing in recent warfare has abundantly demonstrated its antiseptic value as a powerful, penetrating, comparatively non-toxic germicide. "Vaporole" Tincture of Iodine presents a pure 3 per cent. tincture in a hermetically-sealed container. By breaking



the point of the container, the contents are allowed to saturate the surrounding absorbent material, and the product can be used as a swab. By this means fresh tincture of iodine, free from deterioration products likely to cause irritation, becomes instantly available for sterilizing the skin of operation areas, for use upon wound surfaces of all kinds, and as a first-aid application for injuries received in workshops, factories, stables, and so on. "Vaporole" Tincture of Iodine, perfectly stable and portable, and ready for immediate use, is issued in containers of 20 minims, packed in boxes of six; and in containers of $\frac{1}{2}$ fluid ounce, packed singly, each being enclosed in a wooden protecting tube.

"ACROSYL" is a new saponified cresylic disinfectant and antiseptic likely to find favour in sanatorium work.³

¹ The Registers are published by Mr. H. K. Lewis, 136, Gower Street, London, W.C., and are supplied strongly bound, with Index, in books of 50, 100, 150, or 200 forms. The name of the sanatorium can be added on the side if required. A book of 50 forms, bound half black bazil, marbled edges, index, two letters to a page, folioed, costs £1 5s.

² Specimens and particulars of "Vaporole" Tincture of Iodine can be obtained on application to Messrs. Burroughs Wellcome and Co., Snow Hill Buildings, Holborn, London, E.C.

³ Particulars of "Acrosyl" may be obtained from the Acrosyl Company, Sutherland House, Lloyd's Avenue, London, E.C.

"MYCETOL" is a water-soluble cleansing disinfectant and antiseptic, containing 50 per cent. of cresylic acid, introduced by Messrs. Allen and Hanburys.¹ It is alkaline in reaction, and dissolves fatty matters, pus, and mucus.

"Aspirin" is a preparation which for long has found favour in all forms of medical practice, and was often of service in some tuberculous subjects, especially those liable to rheumatic manifestations. A substitute, identical in every essential respect, has been introduced under the designation of "HELICON."²

Hæmorrhoids and other forms of rectal trouble are often met with in tuberculous subjects, and add to the difficulties of treatment. Messrs. Allen and Hanburys have recently introduced "HÆMORRHOIDAL SUPPOSITORIES" and an "UNG. HÆMORRHOIDAL" which are likely to prove of service. The former exhibit the healing, antiseptic, and resolvent properties of balsam of Peru, resorcin, and iodol, in combination with the astringent and local tonic action of the supra-renal gland. The latter is a soothing and antiseptic application containing phenol, oxide of zinc, cocaine, and lanolin. It is particularly valuable in cases of pruritus.³

At this time of the year, when disorders of the throat are common, reference may be made to the excellent series of THROAT PASTILLES manufactured by Messrs. Allen and Hanburys.⁴ No less than eighty forms are available. Many of these prove of much service in cases of pulmonary and laryngeal tuberculosis and the catarrhal conditions commonly met with in other tuberculous cases.

We have recently had an opportunity of trying the excellent series of "SEMPROLIN" EMULSIONS manufactured by Messrs. William Browning and Co. These are particularly elegant combinations of a specially high-grade petroleum, with such useful medicaments as hypophosphites, glycerophosphates, malt and iron, guaiacol, potassium iodide, lecithin, salol, etc. We cannot speak too highly of this admirable series.⁵

"DIOXOGEN" is a preparation which will be found of the greatest service in dealing with cases of oral sepsis, tonsillitis, naso-pharyngeal catarrh, and many other conditions frequently met with in tuberculous subjects. It is one of the most reliable and efficient forms of peroxide of hydrogen.⁶

¹ Samples and full particulars of "Mycetol" may be obtained on application to Messrs. Allen and Hanburys, 37, Lombard Street, London, E.C.

² Specimens and particulars of "Helicon" can be obtained on application to the manufacturers, the Castle Laboratory, Jeffrey Place, London, N.W.

³ Particulars of the Suppositories and Ointment for Hæmorrhoid Cases may be obtained from Messrs. Allen and Hanburys, Bethnal Green, London, E.

⁴ A full list of the Pastilles manufactured by Messrs. Allen and Hanburys may be obtained on application to 37, Lombard Street, London, E.C., or 7, Vere Street, Cavendish Square, W.

⁵ Full particulars of the "Semplolin" Brand Emulsions may be obtained from Messrs. William Browning and Co., 4, Lambeth Palace Road, London, S.E.

⁶ "Dioxogen" is prepared by the Oakland Chemical Company of New York, and specimens and particulars can be obtained from the sole agents for Great Britain, Messrs. Allen and Hanburys, Ltd., 37, Lombard Street, London, E.C.

"SPHAGNOL" preparations will be found of much service in dealing with some of the common forms of cutaneous disease frequently met with in tuberculous patients. For cases of chronic eczema, psoriasis, pruritus, and also for some subjects of acne, "Sphagnol" proves very effective.¹

"GLYMIEL" JELLY is a cosmetic preparation which will be found of considerable advantage for patients undergoing open-air treatment. It is a reliable emollient conveniently put up in metallic tubes which can be safely carried in the pocket. For application to the face and hands it is excellent, affording much protection from sun and heat rays and wet and cold winds. It is a helpful agent in allaying irritation and the treatment of rough and cracked skin.²

¹ Full particulars of "Sphagnol" preparations may be obtained from the manufacturers, Peat Products (Sphagnol), Ltd., 18 and 19, Queenhithe, Upper Thames Street, London, E.C.

² "Glymiel" Jelly is supplied by Messrs. Osborne, Bauer and Cheeseman, 19, Golden Square, and 5, Lower John Street, Regent Street, London, W.

NOTES.

EDITORIAL.

THE BRITISH JOURNAL OF TUBERCULOSIS with this number enters on its ninth year. The New Year finds us as a people engaged in the Greatest of Conflicts. Compared to the War now being waged, all other campaigns seem insignificant. While we count no sacrifice too great to secure the defence of this Land of Freedom and the supremacy of our Empire of Liberty and Justice, it is necessary that even in these days of national crisis nothing shall be left undone which may be essential to the wellbeing of our people. For the present any active forward movement in connection with the so-called Anti-Tuberculosis Crusade is well-nigh impossible. It is of the utmost importance, however, that ground won shall not be lost: agencies established must be supported, organizations now available must be employed to the best advantage, and statutory powers should not be permitted to remain unused. As far as lies in us tuberculosis work must be carried on "as usual." And there is every reason why this policy should be acted upon. The stress and strain of many months of exceptional physical and mental efforts must tell seriously on the health of our sailors and soldiers. Not a few of our defenders are of tuberculous inheritance, or have been the subjects of a tuberculous infection that has been prevented from becoming active. Recruits who have been the subjects of definite tuberculous disease have been accepted for active service. We understand that in some cases patients have left sanatoria in order to join the forces. Service on the field and on the sea, under conditions of unexampled hardship, will almost inevitably lead to a lighting up of old tuberculous trouble. Moreover, it should be remembered that the injuries and disorders which must be the portion of large numbers of men, will make at least some of them susceptible to tuberculosis infection. It is to be feared, also, that conditions of privation, anxiety, and disease among considerable numbers of the home population may lead to a spread of tuberculosis. Certainly special care should be taken to conserve our coming citizens. In many parts of the country the work of tuberculosis officers is being restricted, schemes for the extension of sanatoria and the opening of new centres for the institutional care of consumptives and other tuberculous subjects are being hung up and proposals for the establishment of open-air schools and other much needed agencies for dealing with delicate children are being dropped or deferred. These things should not be. It is worth making exceptional sacrifices to maintain all tuberculosis work in fullest efficiency, and to extend the same in districts where the need is urgent.

We are strongly of opinion that all hospitals and sanatoria should be used to the best advantage. The members of the medical staff of old-established institutions which for long years have taken a leading place in dealing with consumptives, should be brought into our national system for dealing with tuberculosis, and should be given a recognized

place in a clinical consultant staff service. As is generally recognized, many tuberculosis officers have had comparatively little actual experience in the management of cases, and are called to be organizers and administrators rather than expert clinicians. The formation of a corps of expert consultants whose essential duties should be restricted to questions of diagnosis, prognosis and treatment would do much to further the good work which has been so successfully initiated under the provisions of the National Insurance Act.

It is clear also to all serious students of the subject that the tuberculosis problem must be faced as an essential part of our great problem of national health, and must not be restricted by class or industrial distinctions, sex, age, or any conventional limitations. The mind and soul of the nation are alert, new ideals have awakened in the thoughts of the people, an unwonted seriousness of intent has come to us each, and behind and beneath all there is a deep-seated moral force which must make for hygienic righteousness.

It may be permitted here to call attention to the recent publication of "The Year-Book of Open-Air Schools and Children's Sanatoria."¹ Many well-known experts have co-operated to make this new reference work worthy of the cause it seeks to serve. The volume, it is believed, will do much to further the movement for the provision of rational means for the protection of children from the ravages of tuberculosis. The book should be in the hands of all medical practitioners, educationists, and workers for child welfare.

SHELTERS FOR CONSUMPTIVES.

Much ingenuity and skill have been devoted to the designing and construction of effective and yet inexpensive shelters for consumptive and other tuberculous cases. By the use of suitable shelters the accommodation of many sanatoria have been considerably extended, and by the loan of suitable shelters much benefit can be rendered in the after-care of sanatorium and other cases. Dr. Sidney Davies, the Medical Officer of Health for Woolwich, has permitted us to reproduce the accompanying illustration of a shelter which has proved exceedingly serviceable when "lent to needy consumptives for use in their garden or back-yard." Dr. Davies says: "The patients use them mainly for sleeping at night, while they perform their duties as far as possible during the day. These shelters can be used in all weathers. They can be taken to pieces and transferred from place to place."

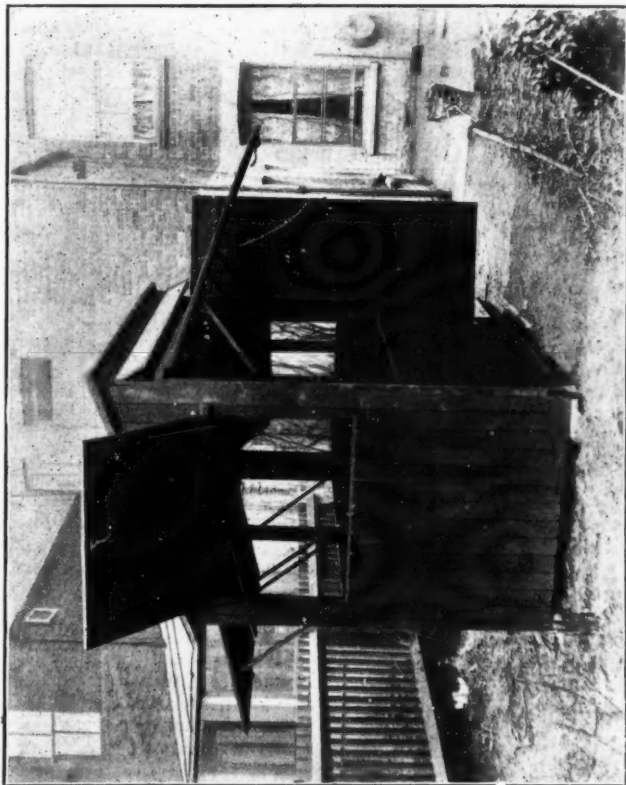
RECORDS OF PROGRESS.

Sir George Newman's Sixth Annual Report has just been issued, and contains important data regarding the prevalence of tuberculosis in childhood, and information regarding means for the prevention and arrest of tuberculosis in early life.² It is stated that "the proportion of tuberculous children actually attending school is less than 1 per cent. This, however, does not include children suffering from incipient

¹ "The Year-Book of Open-Air Schools and Children's Sanatoria" is published by Messrs. John Bale, Sons and Danielsson, Oxford House, 83-91, Great Titchfield Street, Oxford Street, London, W. Price 7s. 6d. net.

² Annual Report for 1913 of the Chief Medical Officer of the Board of Education, London: Wyman and Sons, Ltd., 29, Bream's Buildings, Fetter Lane, E.C. 1914. Price 1s. 8d.

tubercle, or children excluded from school on account of advanced tuberculosis. There can be little doubt that, taking the Elementary School children as a whole, somewhere between 1 and 5 per cent. are suffering from tuberculosis of some form or another. Some authorities estimate a much higher incidence; the figure of 2 per cent. is quoted as a minimum figure." It is estimated that there are approximately 6 million children on the registers of the Public Elementary Schools of



AN OPEN-AIR SHELTER FOR DOMICILIARY TREATMENT.

England and Wales, representing an average attendance of 5½ millions. The report contains sections on Tuberculosis in School Children, and Open-Air Education.

The following note, taken from the *British Medical Journal* for November 28, 1914, deserves the attention of authorities in this country: "The Red Cross is doing useful work in Germany, quite apart from its activities in connection with the wounded. It has, for example, made extensive preparations for the treatment of soldiers

who may develop pulmonary tuberculosis. At the outbreak of the war Germany had 149 sanatoria for adults and 32 for children. There were also 108 hospitals, containing 20,000 beds, for weak and scrofulous children. In addition there were 1,819 dispensaries and 115 forest homes (*Walderholungsanstalten*), and 19 large institutions, with 1,496 beds, for cases of tuberculosis of the bones and joints. Further, there were several institutions for the treatment of lupus. When the war broke out most of the physicians and nurses attached to these hospitals volunteered for active service, and the hospitals, being temporarily closed, were put at the service of the army medical staff. The risks entailed by this precipitate abandonment of work among the tuberculous were, however, soon realized. Very few indeed of the hospitals were suited for the treatment of the wounded, and their services have been retained by the Government only for cases of tuberculosis among soldiers. In the remaining hospitals work has again been resumed on the old lines for the benefit of the civil population." It is most desirable that arrangements should be made for the adequate treatment of tuberculosis arising among our own sailors and soldiers as well as among the large number of refugees now resident in the British Isles.

The Royal College of Physicians of London has recently issued the following notice regarding the new regulations respecting competition for the Weber-Parkes Prize: "Hitherto the Weber-Parkes Prize has been awarded triennially to the writer of the best essay upon some determined subject connected with the etiology, prevention, pathology, or treatment, of tuberculosis. A silver medal has been awarded to the holder of the prize, and a similar medal, distinguished as the second medal, to the essayist who came next in order of merit. New regulations were adopted by the college, providing that the prize shall be awarded triennially for the best work already done in connection with the etiology, prevention, pathology, or treatment, of tuberculosis. A silver medal will still be awarded to the holder of the prize, but the second medal will not be continued."

A subcommittee of the Metropolitan Asylums Board have approved and forwarded to the Local Government Board sketch-plans prepared by the architect, Mr. E. T. Hall, F.R.I.B.A., of Bedford Square, London, W.C., for the erection of sanatoria (1) for 232 women at Hyde Style, near Godalming, at an estimated cost of £42,138; (2) for 168 men at Felbridge, near East Grinstead, at an estimated cost of £29,900; (3) for 175 men at Ellisfield, near Basingstoke, at an estimated cost of £30,973. In the case of the proposed sanatorium at Godalming, the Local Government Board has already given its general consent to the plans. The plans for the sanatoria at East Grinstead and Basingstoke are still under consideration.

An illustration appears in the *Building News* for December 11, 1914, of the proposed new Hospital for Tuberculosis at Collingham Castle, Hull, the plans of which have been prepared by the City Architect, Mr. Joseph H. Hirst.

We shall be glad if Tuberculosis Officers, Medical Superintendents of Sanatoria, and Medical Officers of Health, will favour us with a copy of their Annual Report as soon after publication as possible, with a note as to any special features likely to be of general interest and service.